CCD-V88E

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

Handycam
Video 8
FL MECHANISM

SPECIFICATIONS

System

Video recording system	Rotary four heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording time	SP mode: 1 hour 30 min. LP mode: 3 hours (P5−90)
Playback time	SP mode: 1 hour 30 min. LP mode: 3 hours (P5−90)
Fast forward/rewind time	Approx. 8 min. (P5−90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 6 × power zoom lens f = 12−72 mm, F1.6 with macro Filter diameter: 46 mm
Auto focus system	TTL
Color temperature	Auto: HOLD INDOOR 3,200 K OUTDOOR 5,800 K
Minimum illumination	7 lux
Illumination range	7 lux−100,000 lux (0.7−9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic, manual (variable)

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, −10dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, −66 dBs, low impedance With 2.5−3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY/PAUSE/
SLOW/▶, ◀
(Editsearch)/⇥/⇤/
STILL/PLAY/▶▶/◀◀
Caution: ⊗/⏏/▣/⊘/⊘
LP/SP mode, FOCUS, IRIS, WHITE BALANCE, ZERO MEM, title colour, ■ indication, TITLE 1/2 mode, title scroll mode, title reverse mode, shutter speed
Recording/battery lamp

— continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements	Battery compartment 6.0 V/7.5 V
Power consumption	5.8 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Dimensions	Approx. 106 × 112 × 300 mm (w/h/d) ($4\frac{1}{4} \times 4\frac{1}{2} \times 11\frac{7}{8}$ in.)
Weight	Approx. 0.9 kg (2 lb) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type
Supplied accessory	Lithium battery CR2025 (1)

Optional accessories

- Battery pack NP-55, NP-77
- DC pack DCP-55
- AC power adaptor AC-V55
- Car battery cord DCC-16AE
- Connecting cable
  - VMC-910MS/920MS (2 phono to 3 phono)
  - VMC-710M/720M (2 phono to 2 phono)
  - VMC-262M (2 phono to 6-pin)
  - VMC-2104M (4 phono to 21-pin)

SERVICE MODE:

In this instrument, service mode is provided in orders to know the set status and for the electric adjustment of camera.

This operation in made by full remote control (RM-95 partically remodelled product).

- For adjustment of EVR (Electron volume) of camera
  ......ADJUST MODE → Refer to SUPPLEMENT-1.
- For checking the set status
  ......STATUS INFORMATION MODE (STATUS MODE)→ Refer to SUPPLEMENT-1.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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1-1. WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Dangerously high voltages are present inside the unit. Do not open the cabinet. Refer servicing to qualified personnel only.

Please refer to the illustration corresponding to the letter code indicated in the instructions.

Notes

- For "once-only" events, it is strongly recommended to have a trial run to check that everything is working perfectly.
- Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.
- For using the recorder abroad, see page 49.
- The following units are packed with the CCD-V88E video camera recorder.
  Battery pack NP-55
  AC power adaptor AC-V30
  RFU adaptor kit RFU-89EA/ASA
  Shoulder strap
  8 mm cassette tape
  For details on these units, please read their instruction manuals.

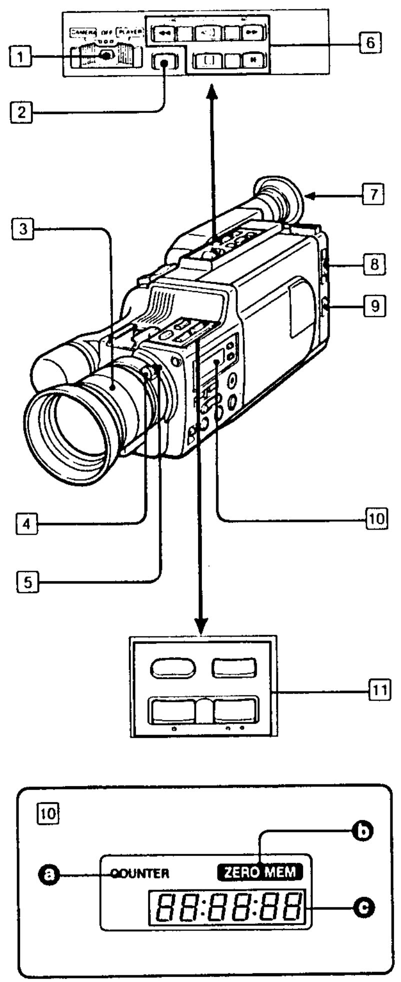
This unit uses 8 mm video format cassettes. It records in the SP mode (approximately 20.051 mm/second) and in the LP mode (approximately 10.058 mm/second) and can play back in the SP mode and LP mode.

SECTION 1
GENERAL

This section is extracted from instraction manual.

1-2. LOCATION AND FUNCTION OF PARTS AND CONTROLS

A-1



For details on the use of each control, refer to the pages indicated in the circle.

A-1

1 POWER switch
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

2 DATA SCREEN button
Press to display the indication on the viewfinder screen on the TV.

3 Focus ring ㉒

4 Zoom lever ㉑

5 Macro set button ㉓

6 Tape transport buttons
◀ (playback)
◀◀ FF (fast forward)
▶▶ REW (rewind)
■ (stop)
❚❚ (pause)

7 Viewfinder ⑮
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

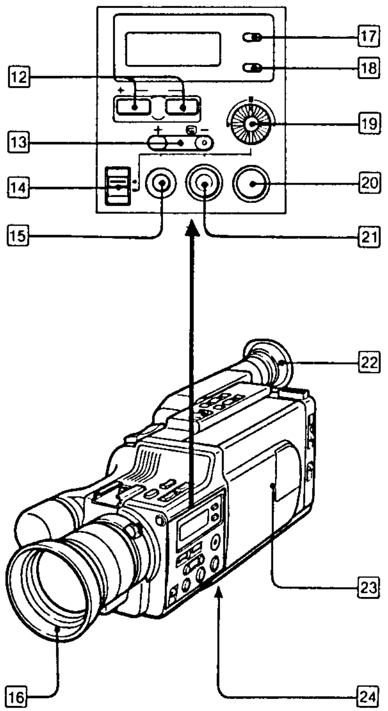
8 Cassette eject button ⑫

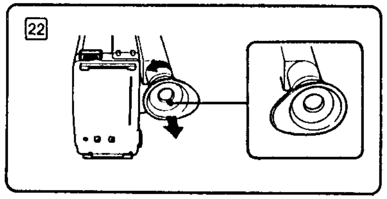
9 BATT (battery eject) knob ⑧

10 Display window
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory) indicator
ⓒ Indicates the time, date or the tape counter.

11 SUPERIMPOSE buttons ㉝
Used to record the title.
TITLE 1 button
TITLE 2 button
MEMORY button
COLOR/MODE button

A-2





A-2

12 DATE and TIME SET buttons ㉚
Press to display or turn off the date or time.

13 EDITSEARCH button ⑭, ⑰, ⑲

14 AUTO LOCK switch ⑱
Normally set to the upper AUTO LOCK position (green mark).
To adjust the focus, white balance, iris or shutter speed manually, set to the lower position (white mark).

15 SHUTTER SPEED button ㉕
Used to select the shutter speed.

16 Lens hood

17 RESET button
Press to reset the counter to zero.

18 ZERO MEM (zero memory) button
Used to memorize the counter zero point.

19 IRIS control
Normally set to the center position (green mark).

20 FOCUS button ㉒
Used for manual focusing.

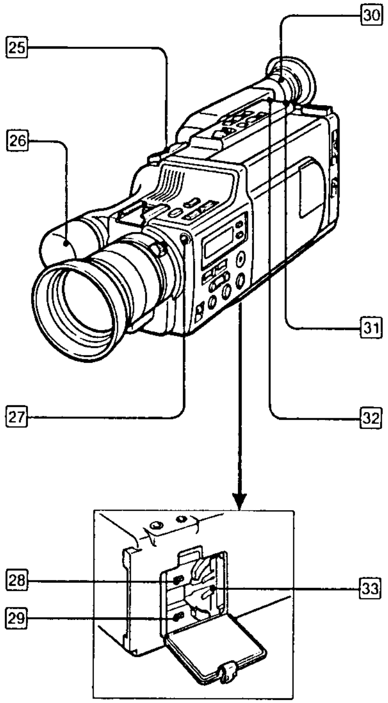
21 WHITE BAL (balance) button
Used for manual white balance adjustment.

22 Eyecup
The eyecup is attached for the right eye.
For the left eye, detach the rubber eyecup and attach it as illustrated.

23 Cassette holder

24 Tripod receptacle

A-3



A-3

25 Power zoom button ㉑

26 Built-in microphone (monaural)

27 Camera recording/battery/tape end lamp
Lights during camera recording. It blinks when the battery is exhausted or the tape is at its end.

28 EDIT switch ㊺
Normally set it to the OFF position. When editing tapes, set in the direction of the arrow (ON).

29 REC MODE (recording mode) selector
Select the recording tape speed, SP or LP.

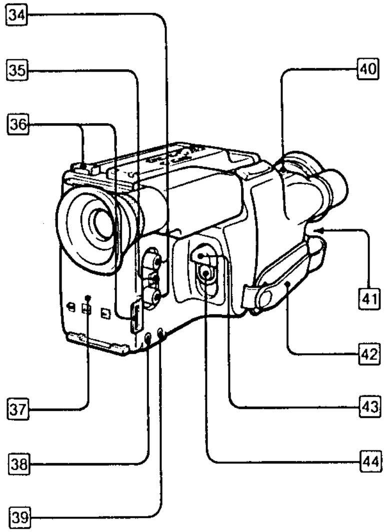
30 Viewfinder lens adjustment ring ⑬
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

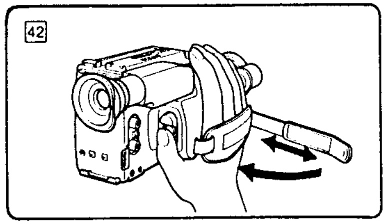
31 Caution lamp
Blinks when a fault has occurred in the unit.

32 DEW lamp
Blinks when moisture has condensed inside the unit.

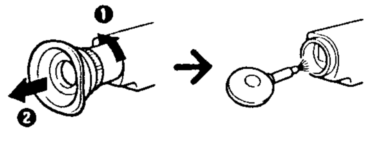
33 Lithium battery compartment ⑪

A-4





A-5



A-4

34 VIDEO/AUDIO OUT (output) jacks (phono jacks)

35 RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Supplies power to the RFU adaptor.

36 Hooks for shoulder strap
Attach a shoulder strap.

37 Battery mounting surface

38 🎧 (earphone) jack (minijack)

39 REMOTE connector (stereo mini-minijack)
Connect an optional GP-80 Remote Commander or wired Remote Commander RM-95 (available in near future).
Do not connect other equipment.

40 Accessory shoe
Attach a video light, etc.

41 MIC jack and DC OUT (microphone power output) jack
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

42 Grip strap
Adjust the length so that your thumb can easily manipulate the START/STOP button.

43 STANDBY switch
Slide up to set the unit to recording pause mode.

44 START/STOP button
Press to start and stop camera recording.

To remove dust from inside the viewfinder A-5
Detach the eyecup as illustrated and clean the surface of the cathode ray tube with a blower.

When connecting another equipment to the video camera recorder
First remove the contact guards from the jacks to be used. Store the contact guards for future use.

1-3. POWER SOURCES

Selection of Power Sources

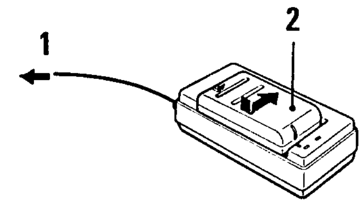
This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor AC-V30 or AC-V55 (page 10)
	Outdoors	Battery pack	Battery pack NP-55 or NP-77 (page 8)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 10)

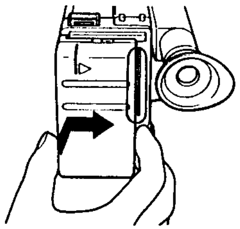
Notes on power source
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

Optional Accessories for Charging
- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously.
- **BCA-70 or BCA-80 battery charge adaptor, ACP-88 AC pack and NPA-55 battery adaptor**
  For charging, insert an NP-55 into the NPA-55.

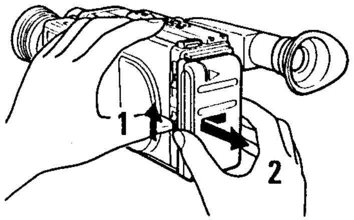
B-1



B-2



B-3



Battery Pack — NP-55 or NP-77

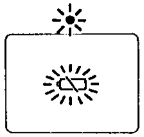
First, charge the battery pack. B-1
Use the AC-V30 AC power adaptor.
The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77 battery pack.

1 Connect the AC-V30 to a wall outlet.
2 Attach the battery pack to the AC-V30.
  Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack, slide it as illustrated.

To attach the battery pack to the video camera recorder B-2
Align the right side of the battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

To remove the battery pack B-3
While pressing the BATT knob in the arrow direction, slide and pull out the battery pack as illustrated.

B-4



Battery life
A fully-charged NP-55 battery pack provides approximately 50 minutes of continuous camera recording, and an NP-77 provides approximately 95 minutes of continuous camera recording.

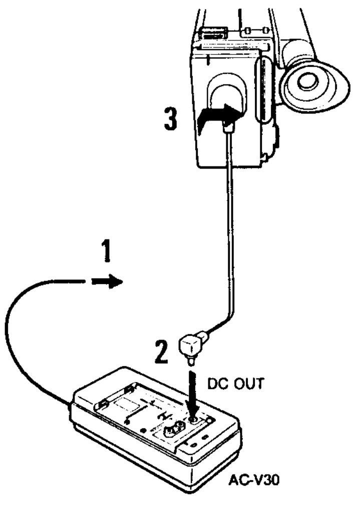
When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

When the battery becomes weak B-4
The ▭ indication and red lamp blink in the viewfinder.
Replace the battery pack with the fully charged one.

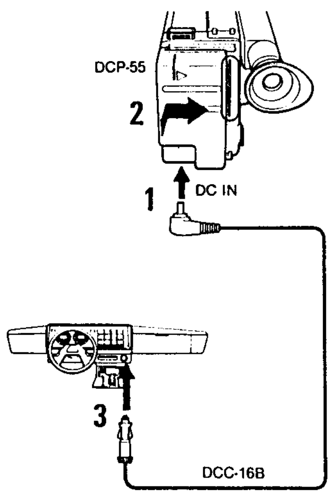
Notes
- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, its operating time is also shortened.

Using the NP-22 battery pack
A fully-charged NP-22 battery pack can operate this unit for approximately 80 minutes. For using the NP-22, an optional NPA-22 battery adaptor is necessary.

B-5



B-6



House Current — Using AC Power Adaptor B-5

1 Connect the AC power adaptor to a wall outlet.
2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.
3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

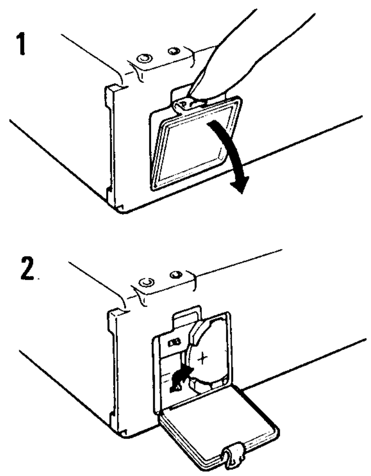
Car Battery — Using the DC Pack B-6

1 Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.
2 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.
3 Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

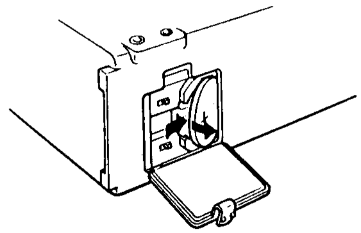
To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

C-1



C-2



Lithium Battery C-1

To insert the lithium battery
This unit uses a lithium battery to activate the clock and to keep titles in memory. Before operating the unit for the first time, install the supplied lithium battery:

1 Open the cover of the lithium battery compartment on the bottom.
2 Install the supplied CR2025 lithium battery with the ⊕ side facing out.
3 Close the cover.

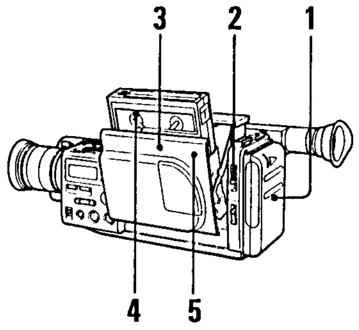
To remove the lithium battery C-2
Press the side of the battery in the direction as indicated for installation.

Lithium battery life
Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a Sony CR2025. Use of another battery may present a risk of fire or explosion.
After replacing the battery, readjust the date, time and titles. (If the battery is replaced with the battery pack attached, the readjustments are not necessary.)

Notes on lithium battery
- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

1-4. CASSETTE CARE

D-1



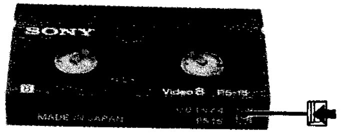
Cassette Insertion D-1

1 Connect a power source.
2 Press and slide down the cassette eject button.
The upper lid of the cassette compartment will lift.
3 Open the cassette holder with your hand until it locks.
4 Insert a cassette with the window facing outside.
5 Press the PUSH mark to close the cassette holder.

Cassette Ejection

1 Make sure that a power source is connected.
2 Press and slide down the cassette eject button.
3 Open the cassette holder with your hand until it locks.
4 Take out the cassette and press the PUSH mark to close the cassette holder.

D-2



To Prevent Accidental Erasure D-2

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

Recording Mode

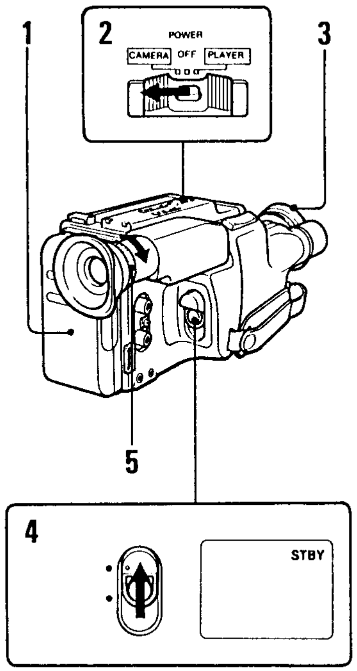
The recording time of a cassette in the LP mode is twice as long as that in the SP mode.
The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

Notes
- Don't press the upper lid of the cassette compartment forcibly when it is moving.
- When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower.
- When inserting or removing the cassette, stand the unit upright. Otherwise, the cassette may be damaged.

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

1-5. ADJUSTMENT OF THE POSITION OF THE VIEWFINDER LENS

E



The position of the viewfinder lens for optimum vision varies depending on the person. E

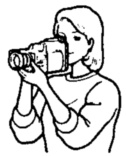
1 Connect a power source.
2 While pressing the small button, set the POWER switch to CAMERA.
3 Remove the lens cap.
4 Slide the STANDBY switch up.
5 Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.

Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

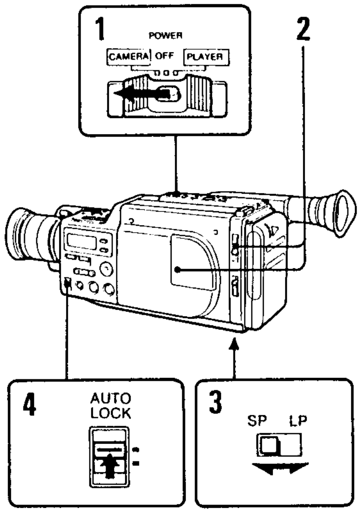
Note
If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the STANDBY switch down once and slide it up again. To start recording, press the START/STOP button.

1-6. EASY CAMERA RECORDING WITH AUTOMATIC ADJUSTMENT

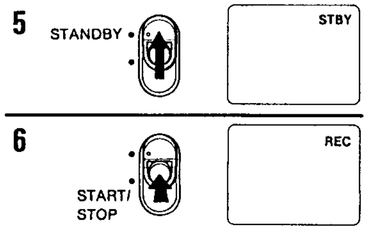
F-1



F-2



F-3



How to Record

Hold the camera recorder as in the illustration.
If your nose touches the recorder, adjust the angle of the viewfinder. F-1

F-2

1 While pressing the small button, set the POWER switch to CAMERA.
2 Insert the cassette.
3 Set the REC MODE selector to LP or SP, according to the length of the programme to be recorded.
4 Set the AUTO LOCK switch to AUTO LOCK (green position).
5 Slide the STANDBY switch up. F-3
The unit will enter the recording pause mode.
6 Press the START/STOP button.
Recording will start.

Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

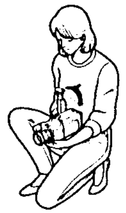
To stop recording
Press the START/STOP button again.
The unit will enter the recording pause mode.
Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

To check the last portion of the previous recording
1 Set the recorder in recording pause mode by pressing the START/STOP button.
2 Press the – EDITSEARCH button momentarily.
The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

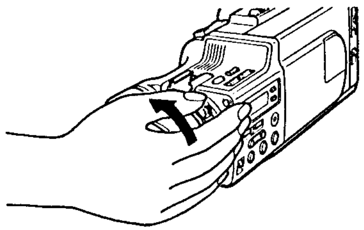
If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CL video head cleaning cassette.

After using
Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

F-4



F-5



F-4

For low angle recording
The viewfinder can be turned 90 degrees up.
1 Slide the STANDBY switch up.
2 Press the START/STOP button.

When attaching the lens hood, filter or conversion lens, hold the focus ring.

When removing, press it with the palm of your hand and turn it counterclockwise. F-5

Note on power source
If the POWER switch is moved during recording, the tape will stop.

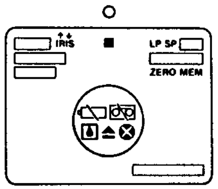
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VTR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

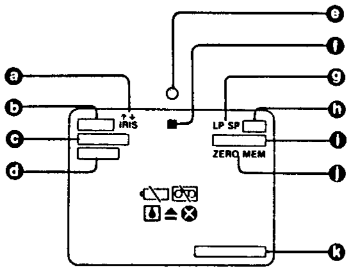
Notes on automatic adjustment
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens clean.

The camera recording with automatic adjustment may not produce optimum results under certain conditions. In this case, manually adjust the focus, white balance and iris. See pages 21, 23 and 27.

F-6



F-7



Indications Inside the Viewfinder

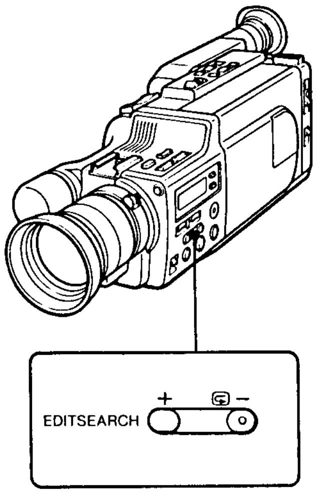
Indications for caution F-6

🔋	Slow blinking • The battery is weak. Fast blinking • The battery is exhausted.
📼	Slow blinking • The tape is near its end. • No cassette is inserted. Fast blinking • The tape is at its end.
⏏	Blinking • A fault has occurred in the unit. See page 54.
⊗	Blinking • The gap of the head is clogged. (Head contamination) See page 54.
💧	Blinking • Moisture has condensed inside the unit. See page 47.

Indications for showing the function being used F-7

↑↓ ⓐ IRIS	The iris function has been set to manual.
ⓑ	The white balance function has been set to manual.
ⓒ	Indicates the title mode.
ⓓ	Indicates the shutter speed.
ⓔ	Lights in red during recording.
ⓕ	• Lights when the focus function has been set to manual. • Blinks when the auto focus function does not work due to low light or low contrast. See page 21.
ⓖ	Indicates the recording or playback mode (SP or LP).
ⓗ	In the VTR operation mode, this indicates the tape transport function.
ⓘ	Indicates the tape counter.
ⓙ ZERO MEM	Blinks when the ZERO MEM button has been pressed.
ⓚ	Indicates the date or time.

F-8



Instant Playback on the Spot F-8

You can monitor the picture just recorded on the viewfinder screen.

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide the STANDBY switch up.
3 Press the "−" side of the EDITSEARCH button to view the playback picture in reverse.
4 Press the "+" side of the EDITSEARCH button to view the playback picture.

During Recording, to Record Again on the Previous Recorded Portion

1 Slide the STANDBY switch up.
2 Monitor the picture on the viewfinder screen and locate the point from which the recording is to begin again with the EDITSEARCH button.
Press the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "−" side to reverse the picture.
3 At the desired point, release the EDITSEARCH button.
The unit will be set to recording pause mode.
4 Press the START/STOP button to start recording.

Smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as above.

To monitor the sound while viewing the playback picture on the viewfinder screen
Connect an earphone to the ⓔ jack.
1 While pressing the small button, set the POWER switch to PLAYER.
2 Press the ►► button to rewind the tape.
3 Press the ■ button to stop the tape.
4 Press the ◄ button to start playback.

To stop the playback, press the ■ button.

Function of the AUTO LOCK Switch

When the AUTO LOCK switch is set to AUTO LOCK (green mark), the white balance, shutter speed (1/50), focus and iris are adjusted automatically. But under certain circumstances, manual adjustment is better for effective recording.

When the AUTO LOCK switch is set to the lower position (white mark), each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BALANCE See page 23.	No indication (Auto) → HOLD → ☀ → ✧
SHUTTER SPEED See page 25.	No indication (1/50) → 120 → 250 → 1000 → 2000 → 4000
FOCUS See page 22.	No indication (Auto) → ■ (Manual)

IRIS See page 27.	↑↓ IRIS (Manual) Turn IRIS toward OPEN or CLOSE. The indication appears on the viewfinder.

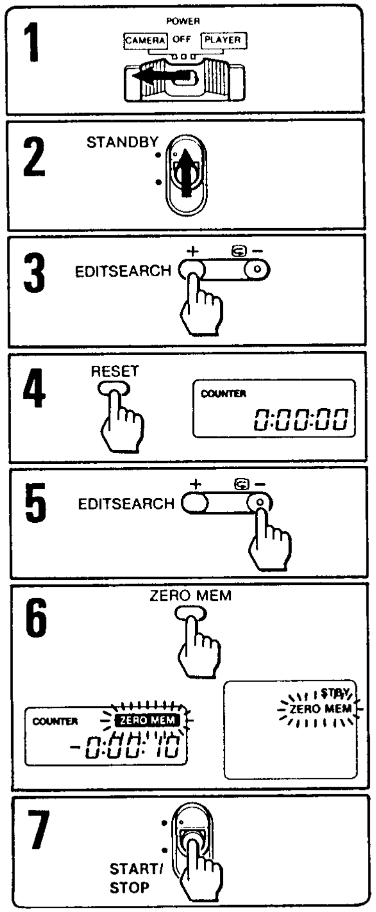
Notes

- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the lower position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the lower position again, the previous manual setting will be recalled.

1-7. INSERT RECORDING

G-1

G-2



You can insert (record) video and audio simultaneously from the camera onto any recorded tape. G-1

Operation G-2

- Monitor the picture being inserted on the viewfinder screen.
- Select the same tape speed as was used for already recorded portion with the REC MODE selector.

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide the STANDBY switch up to set the unit to recording pause mode.
3 Keep pressing the "+" or "−" side of the EDITSEARCH button and release the button at the point where the insert should **end.** The unit will be set to recording pause mode.
4 Display the counter in the display window and press the RESET button. The counter is reset to zero. (For an accurate ending point, press the RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)
5 Keep pressing the "−" side of the EDITSEARCH button and release the button at the point where the insert should **begin.**
6 Press the ZERO MEM button. The insert ending point is stored in memory.
7 Press the START/STOP button. Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To change the insert ending point
Press the ZERO MEM button to turn off the ZERO MEM indicator and repeat steps 3 through 6 above.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

Notes on ZERO MEM Mode
ZERO MEM mode is cancelled automatically in the following cases.

- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

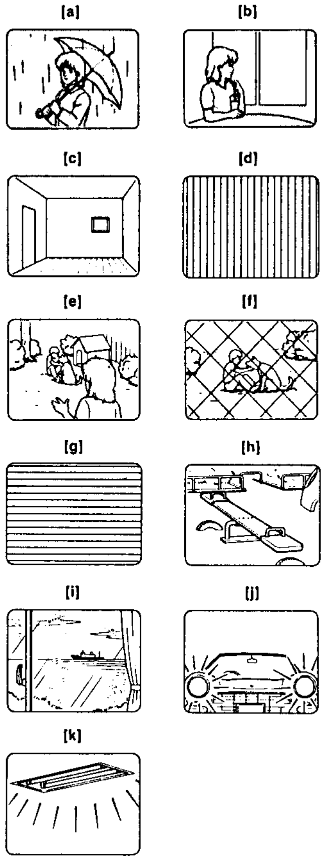
To restore it, press the ZERO MEM button again.

Notes

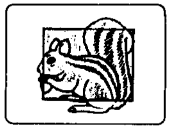
- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be turned off.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

1-8. MANUAL FOCUSING

H-1



H-2



Use manual focusing when shooting subjects difficult to focus automatically.

Poor Conditions for Auto Focusing H-1

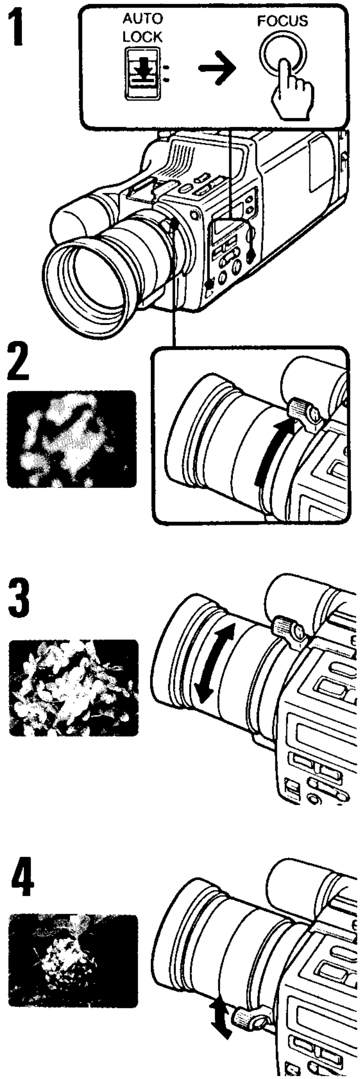
[a] Insufficient light
[b] Too much bright light behind the subject
[c] Subjects with flat colours and less contrast — wall, sky, etc.
[d] Finely detailed repetitive patterns
[e] When the distance between subjects at the center is extreme (e.g. one subject is close, the other is away)
[f] Subjects beyond screens, nets, etc. or when another subject passes across the camera
[g] Horizontal stripes
[h] Diagonal object
[i] When there is frosted glass between the shooting object and the recorder
[j] Bright object or object reflecting light
[k] When shooting under a fluorescent lamp at the shutter speed set to 1/250, 1/1000, 1/2000 or 1/4000

Other Uses of Manual Focusing

- When the white mark inside the viewfinder blinks
- When using special effects lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (When the AUTO LOCK switch is set to AUTO LOCK, the auto focusing operates to move the focus ring automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 29.

Auto focusing system
The auto focusing system incorporated in this unit utilizes high-precision sensors to determine picture contrast at the center of the viewfinder screen (the blue portion marked in the illustration) and adjust focus accordingly for automatic, highly accurate focusing H-2.

H-3



Notes
Auto focus does not function momentarily in these cases:
- When the shutter speed or the white balance is changed
- When the iris is being adjusted
- When lighting conditions change quickly
- When the zooming is changed from wide-angle to telephoto

It may take several seconds to get focus when the camera is rapidly panned from a distant subject to a near subject with less contrast. In this case, adjust the focus manually.

Note on automatic adjustment
During recording with auto focusing, do not turn or stop the focus ring forcibly.

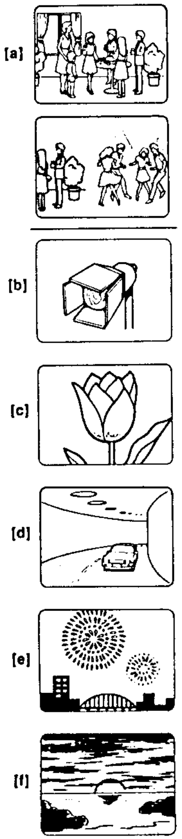
To Focus Manually H-3

1 Set the AUTO LOCK switch to the lower position and press the FOCUS button.
The white mark (■) will be shown in the viewfinder.
2 Turn the manual zoom lever to the telephoto position (72) to make the subject as large as possible in the viewfinder.
3 Turn the focus ring to achieve sharp focus.
4 Set the desired shot length using the manual zoom lever.

Some helpful hints
- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the lens surface.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

1-9. MANUAL WHITE BALANCE ADJUSTMENT

I



In most cases, the auto white balance function of this unit operates automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

Difficult Conditions for Auto White Balance I

[a]	When lighting conditions change quickly	💡
[b]	When the light source for the subject is different from that illuminating this unit, such as when the subject is in a spotlight, etc.	💡
[c]	When shooting a monochromatic subject or the background is monochromatic	HOLD
[d]	When recording under a sodium lamp	💡
	When recording under a mercury lamp	💡
	When recording under a colour matching fluorescent lamp	☀
[e]	When recording outdoors, such as a night view, neon sign or fireworks	☀
[f]	When recording outdoors, such as scenes after sunset or scenes before sunrise.	☀

To Adjust the White Balance Manually

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide the STANDBY switch up.
3 Set the AUTO LOCK switch to the lower position.
4 Select the desired white balance mode by pressing the WHITE BAL button.
Each push of the WHITE BAL button cyclically changes the indication inside the viewfinder.

No indication (Auto) → HOLD → ☀ ─┐
↑ ──────── ⁘ ────────┘

For the colour temperature and the white balance adjustment, see page 62.

To adjust the white balance precisely
1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide the STANDBY switch up.
3 Point the recorder to a white, flat object such as a white wall, paper, etc.
4 Press the WHITE BAL button to indicate the HOLD mark inside the viewfinder.

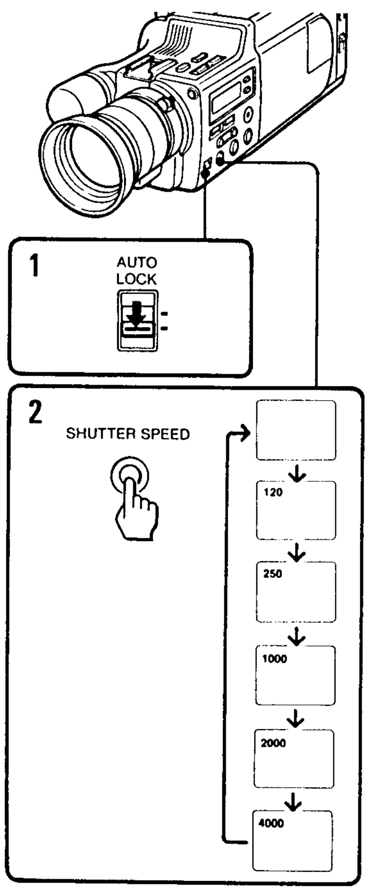
Notes
- When the power is turned off or the light source is changed, reset the HOLD mode again.
- The white balance is related to iris and shutter speed adjustment. When the iris or shutter speed is adjusted manually, if the recorder is moved indoor to outdoor or vice versa, set the AUTO LOCK switch to AUTO LOCK and reset it to the lower position again.
- When the recorder has been moved indoor to outdoor, or vice versa, slide the STANDBY switch up and point the recorder to a white object for about 15 seconds so that the white balance is adjusted properly.

1-10. SHUTTER SPEED ADJUSTMENT

J-1

J-2

J-3



When a fast-moving subject is recorded at a normal shutter speed, its still picture may not be seen clearly when played back J-1. This can be improved by increasing the shutter speed J-2.
The shutter speed of this unit can be selected from six speeds, 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/2000 or 1/4000 second.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.
Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • Recording the skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/120

J-3
1 Set the AUTO LOCK switch to the lower position.
2 Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen.
Each time the SHUTTER SPEED button is pressed, the indication changes:
No indication → 120 → 250 → 1000 → 2000 → 4000
(1/50) (1/120)(1/250)(1/1000)(1/2000)(1/4000)

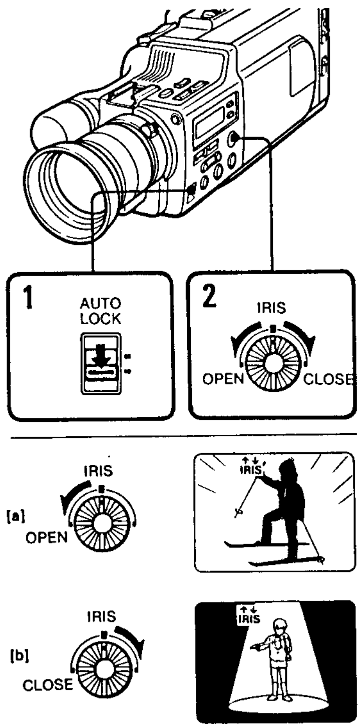
Auto focus will not function when a shutter speed other than the normal speed and 1/120 is selected under a fluorescent lamp.
When shooting, use manual focusing.

Notes

- When shutter speed 1/250 or faster is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

1-11. MANUAL IRIS ADJUSTMENT K

K



The iris is adjusted automatically when the AUTO LOCK switch is set to AUTO LOCK (green position). When shooting a scene with strong contrast, adjust the iris manually.

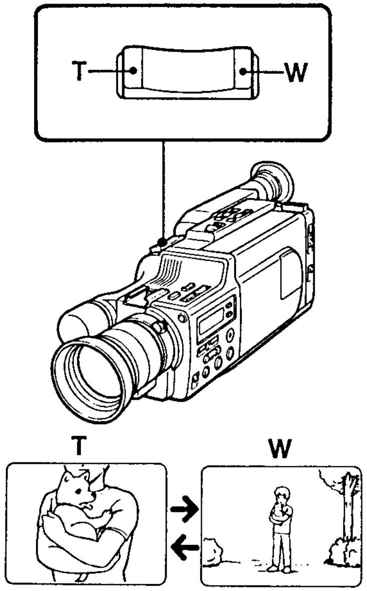
1 Set the AUTO LOCK switch to the lower position (white mark).
2 Adjust the IRIS control.
  [a] When backlit shot results in the subject being too dark: **Turn IRIS toward OPEN.**
  [b] When a subject is too bright against a dark background: **Turn IRIS toward CLOSE.**

After shooting that particular scene, set the IRIS control to the center position (green mark).

Note
Avoid pointing the recorder at the sun with the IRIS control set to OPEN.

1-12. ZOOMING

L-1



The size of the subject in the scene can be changed.

Power Zoom L-1

— for smooth and constant zooming

Press the T side of the power zoom button for telephoto and the W side for wide-angle.
The zoom ring will move automatically.

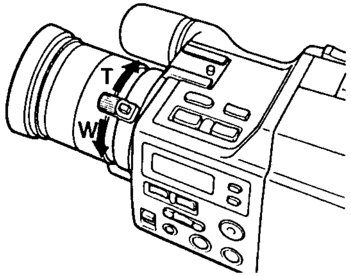
Manual Zoom L-2

— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

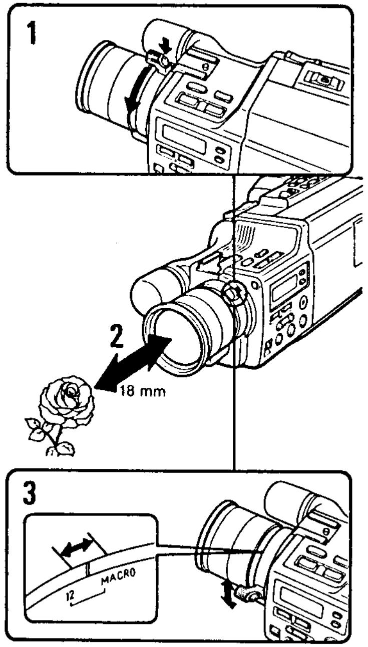
For more zooming effect
- Use an optional conversion lens (VCL-1546A or VCL-0746A).
  Auto focus, however, will not function in that case.
- The focal length of this unit is 12 mm to 72 mm. Converted into the focal length of a 35 mm camera, this means approximately 1·48 mm to 288 mm.

L-2



1-13. CLOSE-UPS (MACRO) M

M



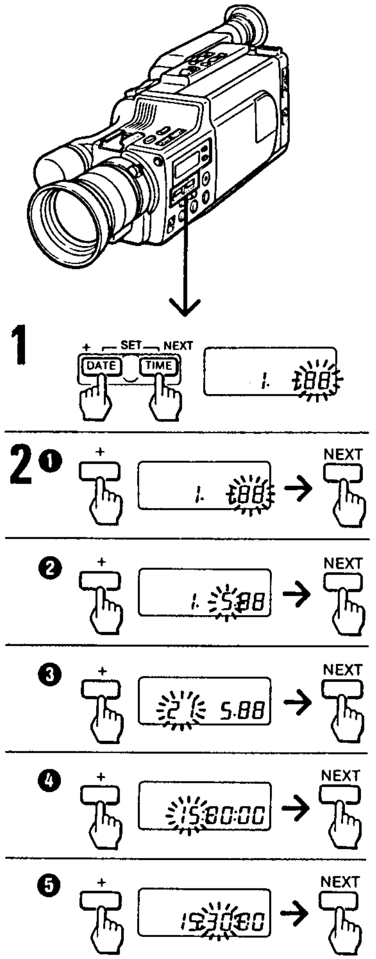
Even tiny objects can literally fill the screen for dramatic close-up effects.
Remove the lens hood before operation.

1 Turn the zoom lever to the MACRO position, pressing the macro set button.
2 Bring the recorder as close as necessary to obtain the desired subject size.
The subject can be as close as approximately 18 mm (3/4 in.) from the lens surface.
3 Turn the zoom lever within the MACRO range to focus sharply. (The power zoom button can be used instead of the zoom lever.)

Notes
- Auto focusing does not function properly in macro shooting.
- If the subject is closer than 18 mm, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.

1-14. RECORDING DATE OR TIME

N-1



Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that the fully-charged battery pack and lithium battery are installed.

To Set Date and Time N-1

1 Press the DATE and TIME buttons simultaneously **for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode).
The DATE button now functions as the + button and the TIME button functions as the NEXT button.

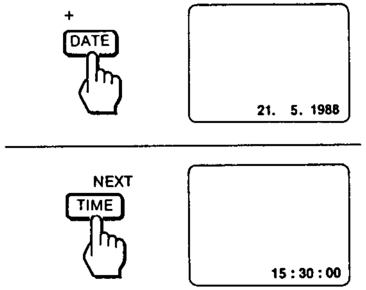
2 Adjust the ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.
First adjust the blinking digits with the + button, and then press the NEXT button.
After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display
Press the TIME (NEXT) button again.

The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

N-2



To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes off.

To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

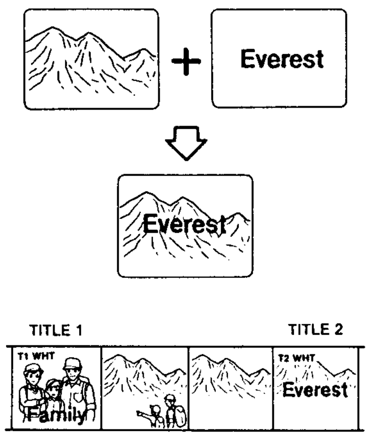
To Record the Date or Time N-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

1-15. RECORDING A TITLE

O-1



Before recording, memorize a title or figure. The memorized title or figure is superimposed onto the picture being recorded. O-1

- Two kinds of titles or figures can be memorized.
- The colour of the title or figure can be selected from 8 colours.

Make sure that the lithium battery is installed. See page 11.

To make a desired title card

- Use a white and plane card and draw the title on it with a deep colour (black is recommended for the best result) in thick letters.
  If contrast is clear, a signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

Before memorizing a title

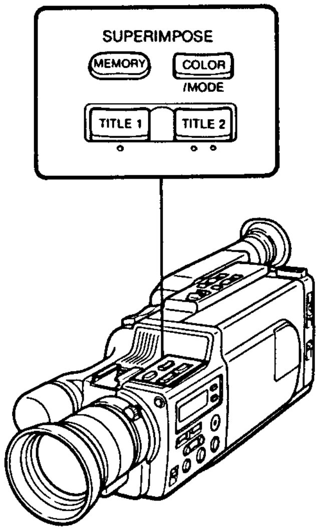
- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button

This button is used to select the title colour or title mode.

When the title is displayed	**When the title is not displayed**
Used as the COLOR button.	Used as the MODE button.
→ WHT → BLUE → GRN → CYAN (white) (green) BLK ← YEL ← VIO ← RED ← (black) (yellow) (violet)	→ No title mode → → ↑ → 🅃 → 🅃↑ → ↑ : title scoll mode 🅃 : title reverse mode 🅃↑ : title reverse and scoll mode
Each push of the COLOR/MODE button cyclically changes the colour or mode.	

O-2



To Memorize the Title O-2

1 While pressing the small button, set the POWER switch to CAMERA.
2 Slide up the STANDBY switch to set the unit in the recording pause mode.
3 Point the camera to the title card and adjust the focus.
4 Press the TITLE 1 or 2 button.
5 Press the MEMORY button to memorize the title.
6 Select the title colour while observing the colour indication in the viewfinder. Each push on the COLOR/MODE button cyclically changes the colour, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

7 Press the TITLE 1 or 2 button (pressed in step 4) to turn off the title.

Notes

- The colour indication in the viewfinder is not recorded on the tapes.
- You can change the title colour even after starting the recording.

To check the title

To check the memorized title, press the TITLE 1 or 2 button. To turn off the title, press the button again.

To Record the Title

To record the title from the beginning

Press the TITLE 1 or 2 button in recording pause mode, and then start recording.

To record during camera recording

Press the TITLE 1 or 2 button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

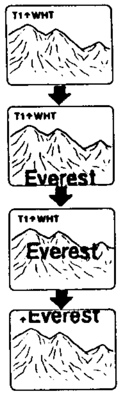
To stop recording the title

Press the TITLE 1 or 2 button again. The picture recording will continue.

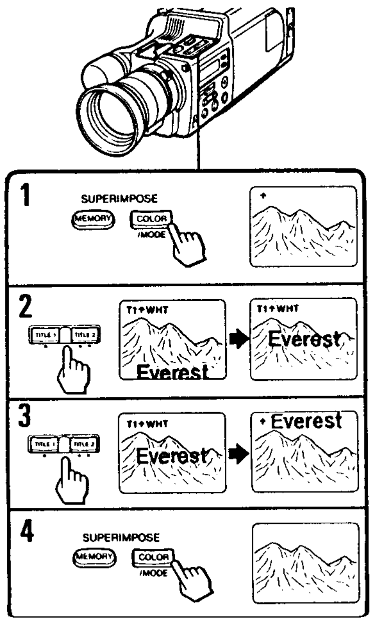
To record the same title several times

By repeating the above procedure, you can record the title as many times as desired.

O-3


T1+WHT
T1+WHT
Everest
T1+WHT
Everest
Everest

O-4


1
SUPERIMPOSE
MEMORY
COLOR/MODE
2
TITLE 1
TITLE 2
T1+WHT
Everest
T1+WHT
Everest
3
TITLE 1
TITLE 2
T1+WHT
Everest
Everest
4
SUPERIMPOSE
MEMORY
COLOR/MODE

To Scroll the Title from Bottom to Top

During recording, the memorized title can be scrolled from bottom to top. O-3

To check the scrolled title O-4
1 In the recording pause mode, press the COLOR/MODE button.
  The arrow mark will be displayed.
2 Press the TITLE 1 or 2 button.
  The title will be displayed from bottom to center.
3 Press the TITLE 1 or 2 button again.
  The title will be displayed from center to top.
4 Press the COLOR/MODE button **three times.**
  The arrow mark will disappear.

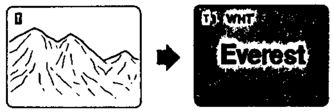
To record the scrolled title
1 In the recording pause mode, press the COLOR/MODE button.
  The arrow mark will be displayed.
2 Start the camera recording.
3 Press the TITLE 1 or 2 button at the point from which the scrolled title is to be recorded.
4 After the title stops at the center of the picture, press the TITLE 1 or 2 button again.
  The title is scrolled from center to top.

To clear the scroll mode
After recording, press the COLOR/MODE button **three times.**

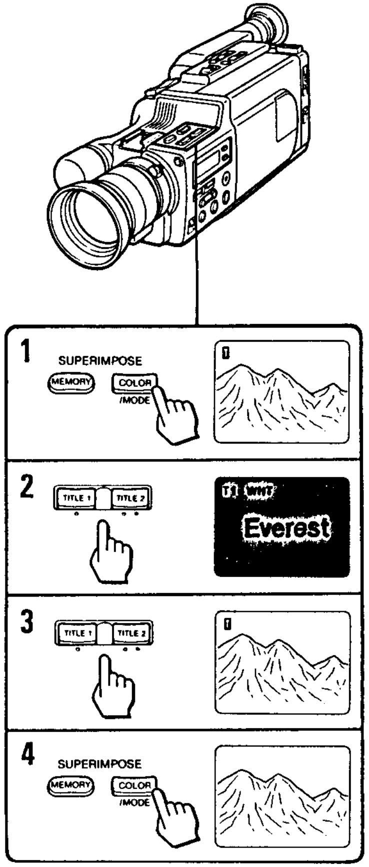
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the title
While the title is being scrolled or displayed at the center, press the COLOR/MODE button.

O-5


T1 WHT
Everest

O-6


1
SUPERIMPOSE
MEMORY
COLOR/MODE
2
TITLE 1
TITLE 2
T1 WHT
Everest
3
TITLE 1
TITLE 2
4
SUPERIMPOSE
MEMORY
COLOR/MODE

To Reverse the Title and the Background

The colour scheme of the title and the background can be reversed. O-5

To check the reversed picture O-6
1 In the recording pause mode, press the COLOR/MODE button **twice.**
  The T mark will be displayed.
2 Press the TITLE 1 or 2 button.
  The reversed title and background will be displayed.
3 Press the TITLE 1 or 2 button again.
4 Press the COLOR/MODE button **twice.**
  The T mark will disappear.

To record the reversed picture from the beginning
1 In the recording pause mode, press the COLOR/MODE button **twice.**
  The T mark will be displayed.
2 Press the TITLE 1 or 2 button.
3 Start the camera recording.
4 Press the TITLE 1 or 2 button again to clear the reversed picture.

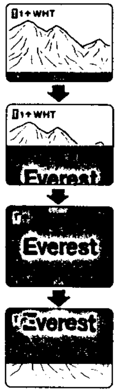
To record the reversed picture during recording
1 In the recording pause mode, press the COLOR/MODE button **twice.**
  The T mark will be displayed.
2 Start the camera recording.
3 Press the TITLE 1 or 2 button at the point from which the reversed picture is to be recorded.
4 Press the TITLE 1 or 2 button again to clear the reversed picture.

To clear the reverse mode
After recording, press the COLOR/MODE button **twice.**

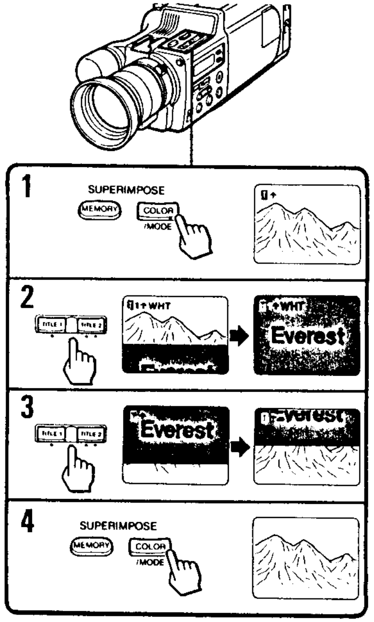
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being displayed, press the COLOR/MODE button.

O-7



O-8



To Scroll the Reversed Title O-7

To check that the reversed title is scrolled O-8

1 In the recording pause mode, press the COLOR/MODE button **three times.**
The arrow mark and the T mark will be displayed.
2 Press the TITLE 1 or 2 button.
The reversed picture will be displayed from bottom to center.
3 Press the TITLE 1 or 2 button again.
The title will be displayed from center to top.
4 Press the COLOR/MODE button **once.**
The marks will disappear.

To record the reversed and scrolled title

1 In the recording pause mode, press the COLOR/MODE button **three times.**
The arrow mark and the T mark will be displayed.
2 Start the camera recording.
3 Press the TITLE 1 or 2 button at the point from which the scrolled title is to be recorded.
4 After the reversed title stops at the center of the picture, press the TITLE 1 or 2 button again.
The reversed title is scrolled from center to top.

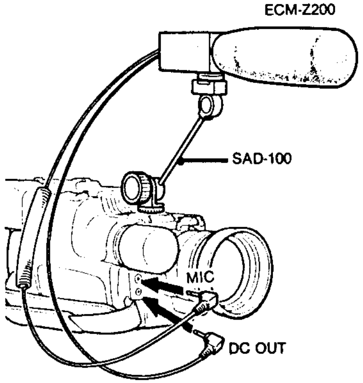
To clear the reversed scroll mode
After recording, press the COLOR/MODE button **once.**

If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

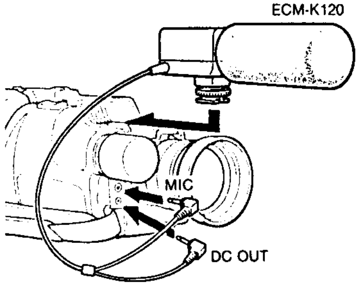
To change the colour of the background
White the title is being scrolled or displayed at the center, press the COLOR/MODE button.

1-16. USE OF AN EXTERNAL MICROPHONE

P-1



P-2



The built-in microphone picks up sounds equally from all directions (omni-directional, monaural type).
By using an optional ECM-Z200 or ECM-K120 microphone, you can enjoy more efficient audio recording.

The **ECM-Z200** can zoom the sound as the lever is slid.
First, attach to the optional SAD-100 external microphone shoe. P-1

The **ECM-K120** can pick up sound in 3 zones and switch from zone to zone as the selector is set. P-2

A variety of optional microphones

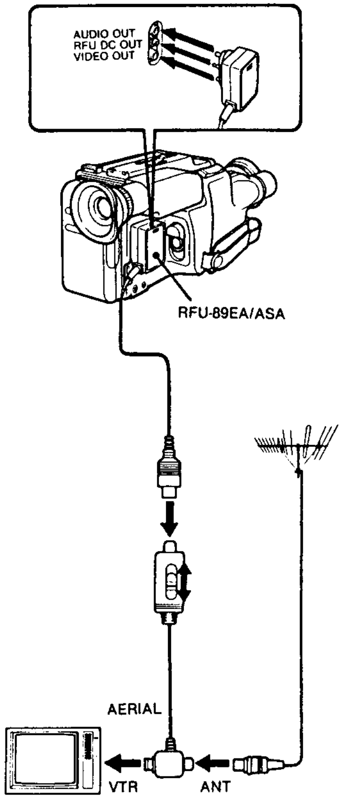
- Omni-directional microphone: To pick up sounds equally from all directions
- Uni-directional microphone: To pick up specific sounds
- Supercardioid microphone: To isolate a sound
- Zoom microphone: To allow the field of recording to be changed.

Notes

- The built-in microphone will not operate when an optional microphone is connected to the MIC jack.
- The MIC jack supplies power to Sony plug-in-power microphones.

1-17. PREPARATION FOR PLAYBACK

Q-1



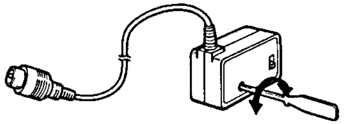
Connecting a TV without audio/video input connectors Q-1

1 Connect the RFU-89EA/ASA RFU adaptor to the CCD-V88E.
2 Connect the aerial, CCD-V88E and TV to the aerial selector (supplied with the RFU-89EA/ASA).
Use a 75-ohm coaxial cable for aerial connection.
3 RFU-89EA only: Set the I/G selector according to the TV system of your country.
4 Adjust one of the TV programme positions to receive the signal from the video camera recorder. See "Adjusting the TV" on page 39.
5 Set the selector switch on the aerial selector as follows:

For viewing a playback picture → VTR
For viewing TV programmes → ANT

6 Select the same programme position on the TV as that selected in adjusting the TV.

Q-2



Adjusting the TV with the RFU-89EA

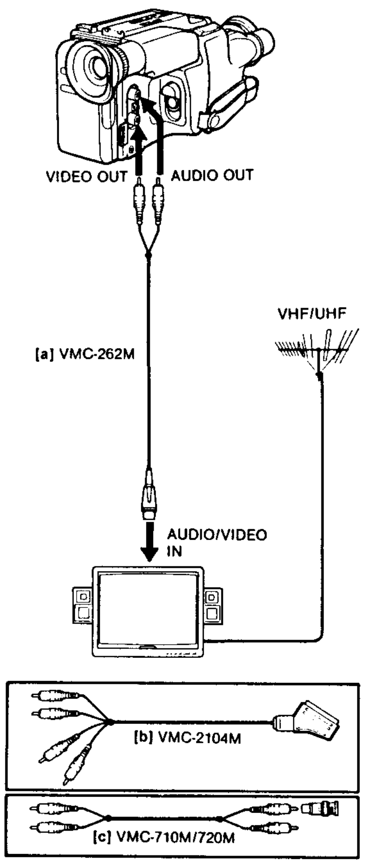
1 Turn on the TV and select a programme position which is not being used to receive a TV station.
2 Set the POWER switch of the CCD-V88E to CAMERA and slide the STANDBY switch up.
3 Set the selector switch of the aerial selector to VTR.
4 Tune the TV until you see the picture and hear the sound from the CCD-V88E.

If the playback picture is not free of disturbance
1 Set the selector switch of the aerial selector to ANT.
2 Adjust the programme position of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the selector switch of the aerial selector to VTR.
4 Slowly turn the RF channel of the RFU-89EA with the supplied screwdriver, until the picture from the CCD-V88E becomes clear. Q-2
Now the TV adjustment is complete.

Adjusting the TV with the RFU-89ASA

Select the CHANNEL selector on the RFU-89ASA to 0 CH or 1 CH, whichever is not active in your area, and select the same channel on the TV.

Q-3



Connecting a TV (or colour monitor) equipped with audio/video input connectors Q-3

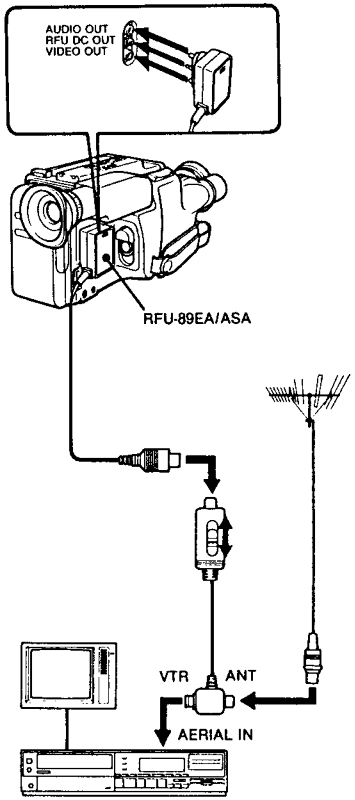
Leave the TV aerial cable connected to the TV.

1 Connect the CCD-V88E to the TV using an optional connecting cable to match the connectors on the TV.
   [a] VMC-262M: to a 6-pin DIN connector
   [b] VMC-2104M: to a 21-pin connector (EUROCONNECTOR)
   [c] VMC-710M/720M: to phono and BNC-type connectors
2 Set the TV/VIDEO selector button on the TV as follows:

For viewing a playback picture → VIDEO
For viewing TV programmes → TV

Note
When the TV has stereo audio inputs, use the optional VMC-910MS/920MS connecting cord.

Q-4



Connecting a TV connected to another VTR without an input selector Q-4

Connect the RFU-89EA/ASA RFU adaptor to the CCD-V88E.

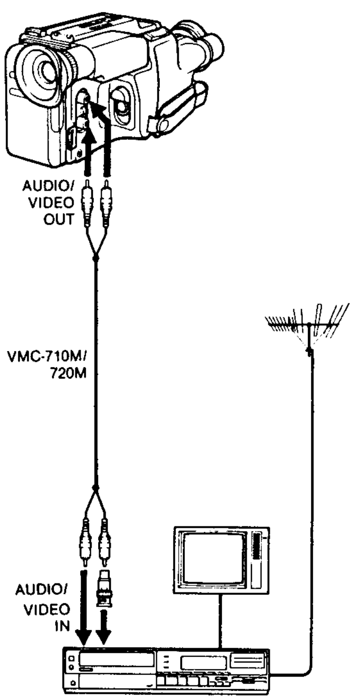
1 Connect the RFU-89EA/ASA, aerial, and the VTR to the aerial selector (supplied with the RFU-89EA/ASA).
   Use a 75-ohm coaxial cable for aerial connection.
2 RFU-89EA only: Set the I/G selector according to the TV system of your country.
3 Adjust one of the TV programme positions to receive the signal from the video camera recorder. See "Adjusting the TV" on page 39.
4 Set the selector switch on the aerial selector as follows:

For viewing a playback picture → VTR
For viewing TV programmes → ANT

5 Select the same channel on the TV as that selected in adjusting the TV.

Connect the others as shown in the illustration.

Q-5



Connecting a TV connected to another VTR with an input selector Q-5

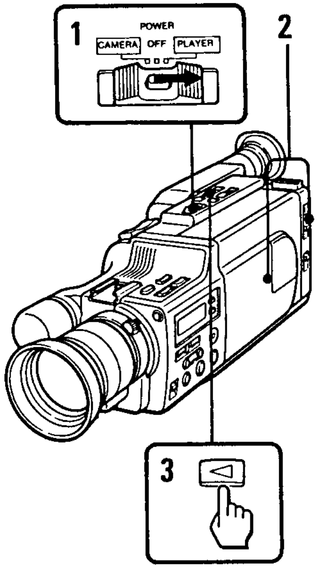
Use the optional VMC-710M/720M connecting cord.

Set the selectors on the VTR as follows:
Input selector → LINE
TV/VTR selector → VTR

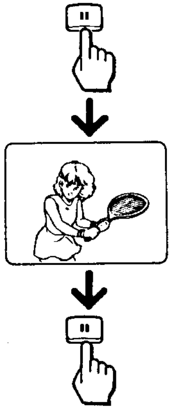
Note
When the VTR to be connected has stereo audio inputs, use the optional VMC-910MS/920MS connecting cord.

1-18. PLAYBACK

R-1



R-2



Turn on the TV (or colour monitor), and select the programme position for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

R-1

1 While pressing the small button, set the POWER switch to PLAYER.
2 Insert a cassette.
3 Press the ◀ button.
Playback will start.

To stop the tape, press the ■ button.

After using, be sure to set the POWER switch on the recorder to OFF.

To view a still picture R-2
Press the II button during playback. To resume playback, press the II button again.

Monitoring a High-Speed Picture

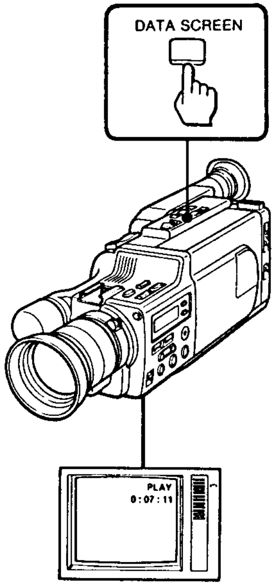
During playback
1 In the playback mode, press the ◀◀ or ▶▶ button.
The picture will be monitored at high speed as long as it is kept pressed.
2 Release the ◀◀ or ▶▶ button at the desired point.
Normal playback will resume.

During fast-forward or rewind
1 Press the ◀◀ button in fast-forward mode or press the ▶▶ button in rewind mode.
The picture is displayed while the button is kept pressed.
2 Release the ◀◀ or ▶▶ button to resume normal fast-forward or rewind mode.

Notes
- If you move the position of the POWER switch during playback, the tape will stop. When you move the POWER switch to CAMERA in the playback pause mode, however, the unit will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.
- When a tape is recorded in SP mode, a still picture and high-speed picture may be noisy with many streaks and become black and white. Streaks will be wider than those of an LP-recorded tape.

1-19. TO DISPLAY THE INDICATION ON THE VIEWFINDER SCREEN ON THE TV S

S



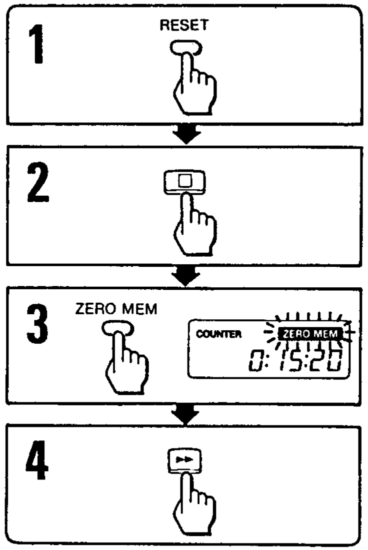
Press the DATA SCREEN button.
The indication on the viewfinder screen is superimposed on the TV programme.
It is convenient to check the indication on the TV screen when the playback picture is viewed on the TV or when the video camera recorder is operated from a distance using the Remote Commander.

To clear the indication, press the DATA SCREEN button again.

Note
To edit from the CCD-V88E to another VTR, clear the indication on the TV or the indication will be recorded with the picture.

1-20. USE OF THE TAPE COUNTER

T



During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press the RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
- The counter does not operate for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations.
- There will be also a time lag of several seconds when the tape recorded in LP and SP modes mixed or the tape having a blank portion between the recorded portions is played back.

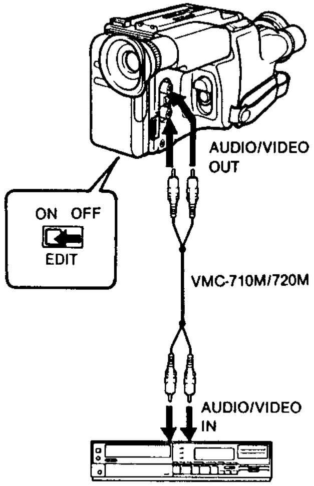
To Return to a Pre-registered Point T

1 During recording or playback, press the RESET button at the point you later want to locate.
2 Press the ■ button when the recording or playback has finished.
3 Press the ZERO MEM button. The "ZERO MEM" indicator will blink in the display window.
4 Press the ▶▶ or ◀◀ button.
The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes
- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

1-21. TAPE EDITING

U



To edit a home movie tape, you will need another VTR or another video camera recorder. U

1 While pressing the small button, set the POWER switch on the CCD-V88E to PLAYER and turn on the other VTR.
2 Slide the EDIT switch on the CCD-V88E in the direction of the arrow (ON).
3 Set the input selector on the VTR to LINE.
4 Press the **II** button on the CCD-V88E during playback at the point where you want to start recording.
5 Press the record button on the other VTR, pressing the **II** button.
6 Release the **II** buttons on both units. Recording will start.

When the VTR to be used is a stereo type, use the VMC-910MS/920MS connecting cord.

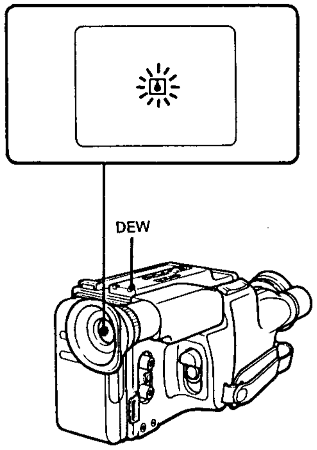
After editing, turn off both units and be sure to slide the EDIT switch in the reversed direction to the arrow (OFF).

To cut off an unnecessary portion
Press the **II** button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

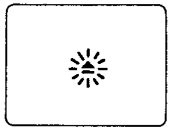
Function of the EDIT switch
Slide this switch in the direction of the arrow (ON) whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the reversed direction to the arrow (OFF).

1-22. NOTES ON MOISTURE CONDENSATION

V-1



V-2



If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: V-1

- The ◙ indicator blinks inside the viewfinder.
- The DEW lamp blinks on the recorder.

No function except for cassette ejection will work.

⬇

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

⬇

The unit can be used again if the ◙ indicator does not appear when the power is turned on again.

If moisture is present on the surface of the tape V-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indicator blinks inside the viewfiner. No function except for cassette ejection will work.

⬇

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indicators, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

1-23. PRECAUTIONS

Operation

- Operate the unit on 6.0–7.5V DC.
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light sources) as this will damage the colour filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  - —Locations susceptible to vibration.
  - —Locations exposed to strong magnetic fields.
  - —Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
  For protection, keep the lens cap on the lens when not using the camera.

1-24. USING YOUR RECORDER ABROAD

Each country has special TV colour broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in colour systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V-240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the PAL system and have the video/audio inputs.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Phillipines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, the Soviet Union, etc.

1-25. TROUBLE SHOOTING

If you think you have a problem, double-check before calling the serviceman.
You may have overlooked something relatively simple!

Symptom	Cause	Procedure
The power will not turn on.	The battery is not attached.	Attach the battery.
	The battery is exhausted.	Use a new battery.
	The AC power adaptor is not connected to a wall outlet.	Connect the adaptor to a wall outlet.
The START/STOP button does not operate.	The tape is affixed to the drum.	Remove the cassette with the cassette eject button.
	The tape is at its end.	Rewind the tape or use a new one.
	The POWER switch is set to PLAYER.	Set it to CAMERA.
	The tab on the cassette is out (red).	Use a new cassette or slide the tab.
The tape does not move when a tape transport button is pressed.	POWER switch is set to CAMERA or OFF.	Set it to PLAYER.
	The tape is at its end.	Rewind the tape or use a new one.
The power turns off.	While being operated in the CAMERA mode, the recorder has been in the pause mode for more than 5 minutes.	Slide down the STANDBY switch, and slide it up again.
	The battery is exhausted.	Use a charged battery.
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high; the camera is not malfunctioning.	–
The battery pack is quickly discharged.	The ambient temperature is too low.	–
	The battery pack has not been charged fully.	Charge the battery pack again.
The cassette cannot be removed from the compartment.	The battery is exhausted.	Use the charged battery or the AC power adaptor.
The auto focusing function does not work.	The AUTO LOCK switch is not set to AUTO LOCK.	Set the AUTO LOCK switch to AUTO LOCK.
	Shooting conditions are not suitable for auto focusing operation. (See page 21.)	Set the AUTO LOCK switch to the lower position and press the FOCUS button to adjust the focus manually.
The colour of the playback is not appropriate.	The AUTO LOCK switch is not set to AUTO LOCK.	Set the AUTO LOCK switch to AUTO LOCK.
	Shooting conditions are not suitable for auto white balance operation. (See page 23.)	Set the AUTO LOCK switch to the lower position and press the WHITE BAL button to adjust the white balance manually.
The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.
The playback picture is not clear.	The EDIT switch is set in the direction of the arrow.	Set the EDIT switch in the reversed direction of the arrow.
	The channel for the VTR is not adjusted on the TV.	Adjust the TV.
The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CL video head cleaning cassette. For details on cleaning, refer to the instructions furnished with the cleaning cassette. If the V8-25CL cleaning cassette is not available in your area, have the heads cleaned at the nearest Sony service facility.
No function except for cassette ejection works.	Moisture condensation has occurred. (See page 47.)	Remove the cassette and leave the unit for at least an hour.
The indicators in the display window blink.	The lithium battery is not installed.	Install the lithium battery.
	The lithium battery is exhausted.	Use a new battery.

1-26. TROUBLE INDICATORS

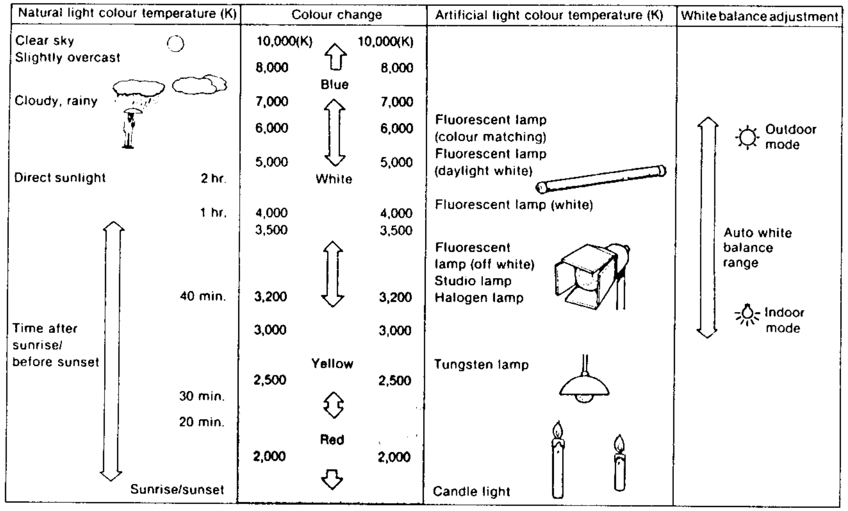
○ when the indicator appears ▨ lighting ▧ slow blinking ▒ fast blinking

Cause	Position of the POWER switch		Indicator				
	PLAYER	CAMERA	Indicator to be shown inside the viewfinder	Camera recording/ battery lamp	Caution lamp	DEW lamp	Indicator to be shown in the display window
The battery is fully exhausted.	○	○	▒ 🔋	▒			
The battery is weak.	○	○	▧ 🔋	▧			
The tape is at its end.		○	▒ 📼 ⏏	▒			
The tape is near its end.	○	○	▧ 📼	▧			
No cassette is inserted.		○	▧ 📼				
The tab on the cassette is out.		○	▧ 📼 ⏏				
Moisture has condensed inside the unit.	○	○	▒ 💧 ⏏			▒	
The gap of the head is clogged.	○	○	▧ ⊗		▧		
Other troubles	○	○	▒ ⏏		▒		
The lithium battery is fully exhausted	○ (The indicator inside the viewfinder does not appear.)	○	▧ 0:00:00 (5 seconds) ⇩ ▨ 1.1. 1988 0:00:00				▧ 00:00:00 (counter) or — — — (date) or — : — — (time)
The lithium battery is weak	○ (The indicator inside the viewfinder does not appear.)	○	▧ Time (5 seconds) ⇩ ▨ Normal indication for the operation.				▧ ex. −1:23:45 (counter) or ex. 17.8.88 (date) or ex. 15:30:00 (time)

1-27. UNDERSTANDING LIGHT AND COLOR

Colour temperature—how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light colour." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the colour temperature, which in turn stands for "light colour." As colour temperature increases, the light colour changes from red to yellow to white to blue.

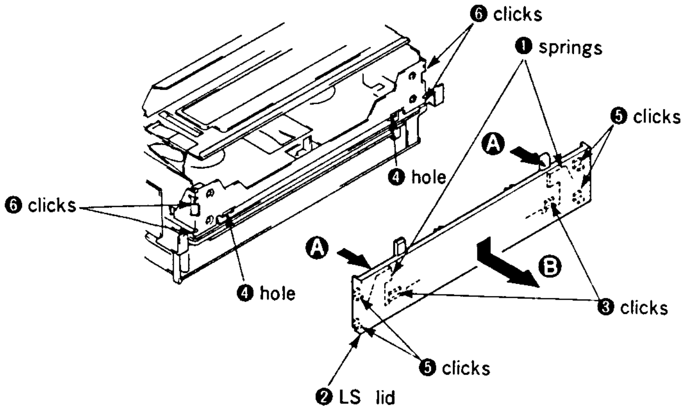


Natural light colour temperature (K)	Colour change			Artificial light colour temperature (K)	White balance adjustment
Clear sky	10,000(K)		10,000(K)		
Slightly overcast	8,000	Blue	8,000		
Cloudy, rainy	7,000		7,000		
	6,000		6,000	Fluorescent lamp (colour matching)	Outdoor mode
	5,000	White	5,000	Fluorescent lamp (daylight white)	
Direct sunlight 2 hr.					
1 hr.	4,000		4,000	Fluorescent lamp (white)	
	3,500		3,500	Fluorescent lamp (off white)	Auto white balance range
40 min.	3,200		3,200	Studio lamp Halogen lamp	
Time after sunrise/ before sunset	3,000		3,000		
30 min.	2,500	Yellow	2,500	Tungsten lamp	Indoor mode
20 min.		Red			
Sunrise/sunset	2,000		2,000	Candle light	

SECTION 2
DISASSEMBLY

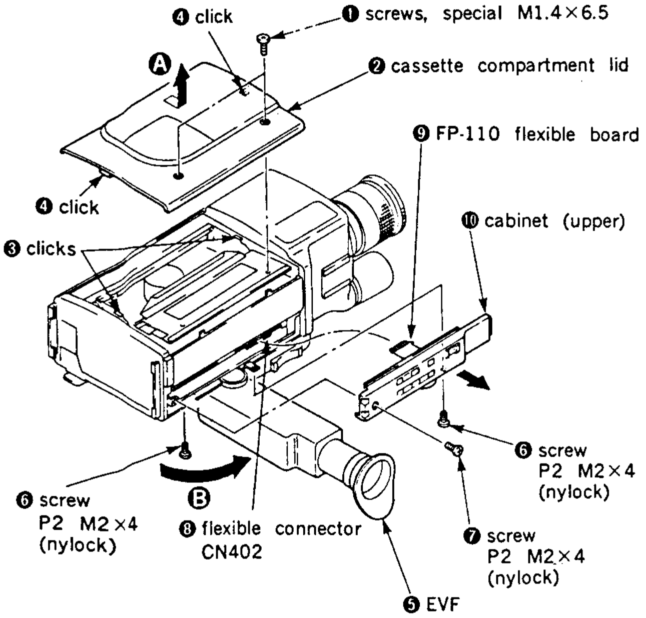
2-1. REMOVAL OF LS LID

1) Push the springs ❶ (two places) in the direction shown by the arrow Ⓐ inserting a thin minus (−) driver, and remove the LS lid ❷ in the direction shown by the arrow Ⓑ.
(For fitting: Set so that the clicks ❸ fit in the holes ❹, and the clicks ❺ come to the backsides of the clicks ❻.)


❻ clicks
❶ springs
❺ clicks
Ⓐ
❹ hole
❻ clicks
Ⓐ
Ⓑ
❹ hole
❸ clicks
❺ clicks
❷ LS lid

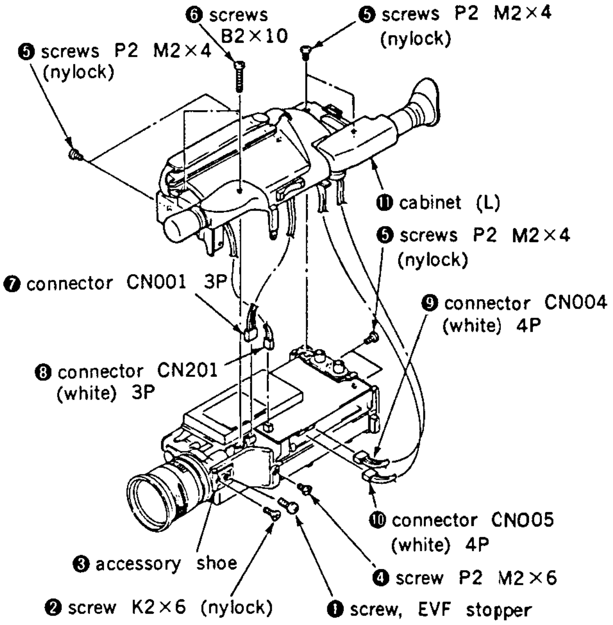
2-2. REMOVAL OF CASSETTE COMPARTMENT LID AND CABINET (UPPER)

1) Remove the two screws ❶.
2) Remove the cassette compartment lid ❷ in the direction shown by the arrow Ⓐ.
(For fitting: Set so that the two clicks ❸ fit in the two clicks ❹.)
3) Move EVF ❺ by 90° in the direction of the arrow Ⓑ.
4) Remove the two screws ❻ and the screw ❼.
5) Remove the FP-110 flexible board ❾ from the flexible connector ❽.
6) Remove the cabinet (upper) ❿.


❹ click
❶ screws, special M1.4×6.5
Ⓐ
❷ cassette compartment lid
❾ FP-110 flexible board
❹ click
❿ cabinet (upper)
❸ clicks
❻ screw
P2 M2×4
(nylock)
❻ screw
P2 M2×4
(nylock)
Ⓑ
❽ flexible connector
CN402
❼ screw
P2 M2×4
(nylock)
❺ EVF

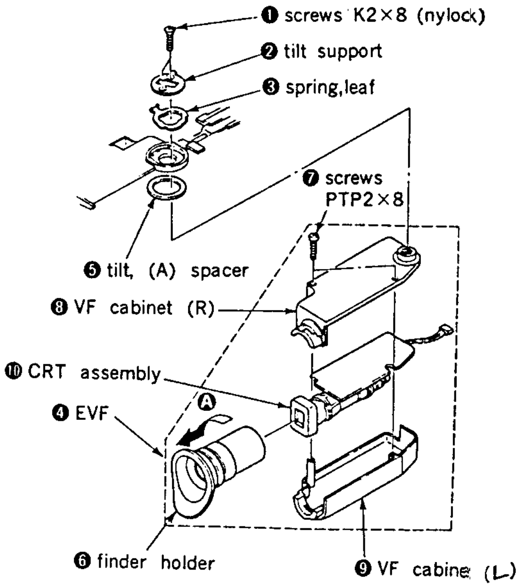
2-3. REMOVAL OF CABINET (LEFT)

1) Remove the screw ❶,❷ and the accessory shoe ❸.
2) Remove the screw ❹, the six screws ❺ and the two screws ❻.
3) Remove the four connectors ❼,❽ and ❾.
4) Remove the cabinet (left) ⓫.


❻ screws
B2×10
❺ screws P2 M2×4
(nylock)
❺ screws P2 M2×4
(nylock)
⓫ cabinet (L)
❺ screws P2 M2×4
(nylock)
❼ connector CN001 3P
❾ connector CN004
(white) 4P
❽ connector CN201
(white) 3P
❿ connector CN005
(white) 4P
❸ accessory shoe
❹ screw P2 M2×6
❷ screw K2×6 (nylock)
❶ screw, EVF stopper

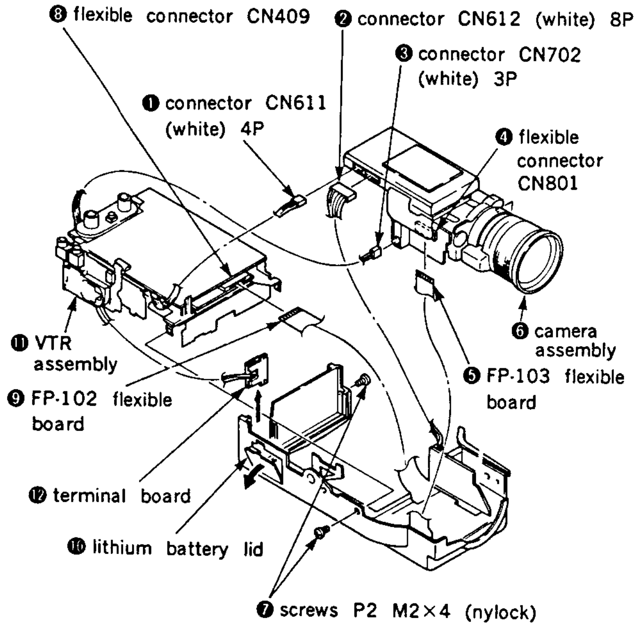
2-4. REMOVAL OF CRT ASSEMBLY

1) Remove the two screws ❶.
2) Remove the tilt support ❷ and the spring, leaf ❸.
3) Remove the EVF ❹ and the tilt, (A) spacer ❺.
4) Remove the finder holder ❻ turning it in the direction shown by the arrow Ⓐ.
5) Remove the two screws ❼.
6) Remove the VF cabinet (R) ❽, VF cabinet (L) ❾, and take out the CRT assembly ❿.


❶ screws K2×8 (nylock)
❷ tilt support
❸ spring,leaf
❼ screws
PTP2×8
❺ tilt, (A) spacer
❽ VF cabinet (R)
❿ CRT assembly
❹ EVF
Ⓐ
❻ finder holder
❾ VF cabinet (L)

2-5. REMOVAL OF CAMERA ASSEMBLY AND VTR ASSEMBLY

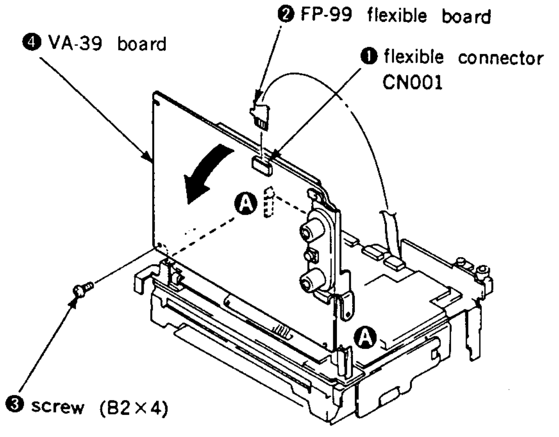
1) Remove the three connectors ❶,❷ and ❸.
2) Remove the FP-103 flexible board ❺ from the flexible connector ❹.
3) Remove the camera assembly ❻.
4) Remove the two screws ❼.
5) Remove the FP-102 flexible board ❾ from the flexible connector ❽.
6) Open the lithium battery lid ❿ and remove the VTR assembly ⓫.



❽ flexible connector CN409
❷ connector CN612 (white) 8P
❸ connector CN702 (white) 3P
❶ connector CN611 (white) 4P
❹ flexible connector CN801
❻ camera assembly
⓫ VTR assembly
❺ FP-103 flexible board
❾ FP-102 flexible board
⓬ terminal board
❿ lithium battery lid
❼ screws P2 M2×4 (nylock)

2-6. OPENING OF VA-39 BOARD

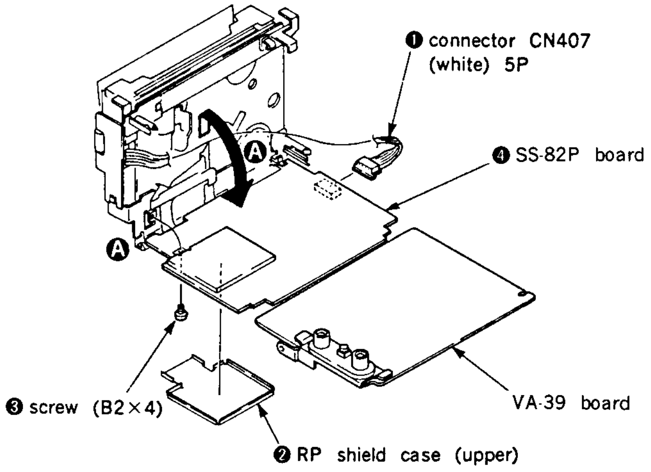
1) Remove the FP-99 flexible board ❷ from the flexible connector ❶.
2) Remove the screw ❸ and the clicks (two places) in Ⓐ part and open the VA-39 board ❹.



❷ FP-99 flexible board
❹ VA-39 board
❶ flexible connector CN001
Ⓐ
Ⓐ
❸ screw (B2×4)

2-7. OPENING SS-82P BOARD

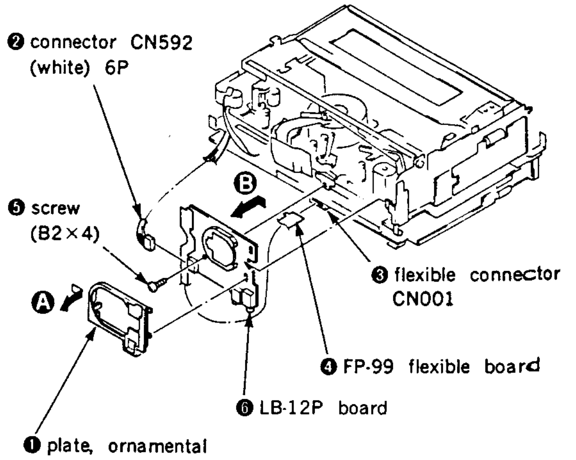
1) Remove the connector ❶.
2) Remove the RP shield case (upper) ❷ and the screw ❸.
3) Remove the clicks (two places) in Ⓐ part and open the SS-82P board ❹ lifting it.



❶ connector CN407 (white) 5P
❹ SS-82P board
Ⓐ
Ⓐ
❸ screw (B2×4)
VA-39 board
❷ RP shield case (upper)

2-8. REMOVAL OF LB-12P BOARD

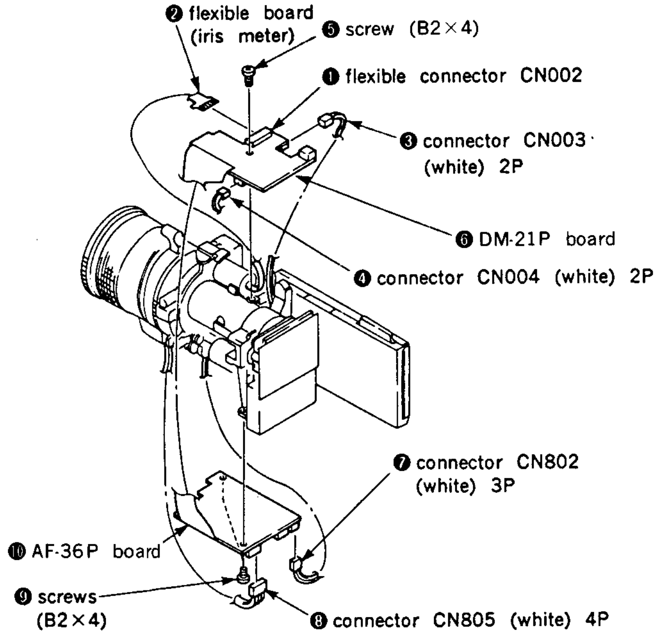
1) Remove the plate, ornametal ❶ pushing it in the direction shown by the arrow Ⓐ.
2) Remove the connector ❷ and remove the FP-99 flexible board ❹ from the flexible connector ❸.
3) Remove the screw ❺.
4) Remove the LB-12P board ❻ in the direction shown by the arrow Ⓑ.



❷ connector CN592 (white) 6P
Ⓑ
❺ screw (B2×4)
Ⓐ
❸ flexible connector CN001
❹ FP-99 flexible board
❻ LB-12P board
❶ plate, ornamental

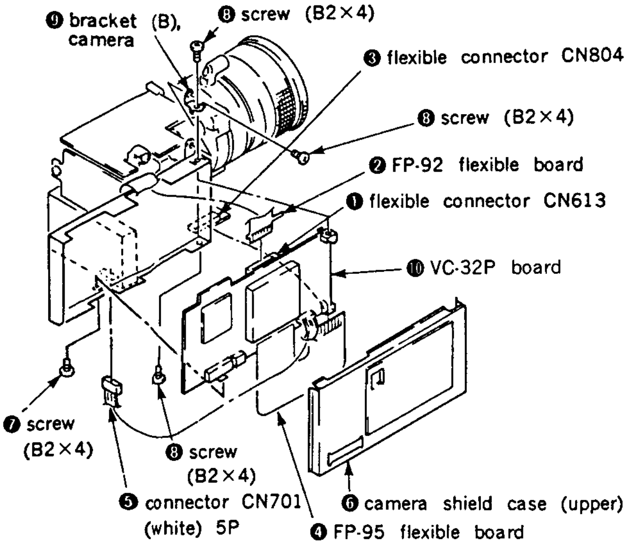
2-9. REMOVAL OF DM-21P BOARD AND AF-36P BOARD

1) Remove the screw ❺.
2) Remove the flexible board ❷ from the flexible connector ❶.
3) Remove the connectors ❸,❹ and DM-21P board ❻.
4) Remove the connectors ❼ and ❽.
5) Remove the two screws ❾ and AF-36P board ❿.


❷ flexible board (iris meter)
❺ screw (B2×4)
❶ flexible connector CN002
❸ connector CN003 (white) 2P
❻ DM-21P board
❹ connector CN004 (white) 2P
❼ connector CN802 (white) 3P
❿ AF-36P board
❾ screws (B2×4)
❽ connector CN805 (white) 4P

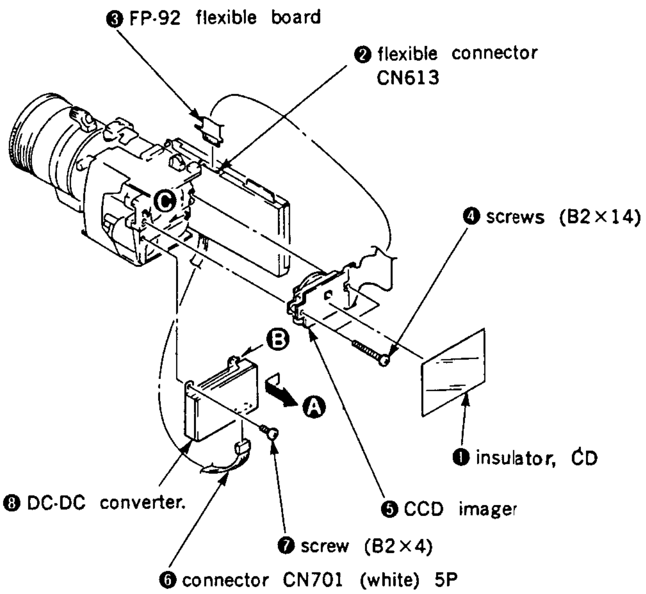
2-10. REMOVAL OF VC-32P BOARD

1) Remove the FP-92 flexible board ❷ from the flexible connector ❶. (at this time, take off the soldering to the shield case.)
2) Remove the FP-95 flexible board ❹ from the flexible connector ❸. (It can not be removed unless the AF-36P board is removed befoohard.)
3) Remove the connector ❺ and the screw ❼.
4) Remove the camera shield case (upper) ❻.
5) Remove the three screws ❽.
6) Remove the bracket (B), camera ❾ and the VC-32P board ❿.


❾ bracket (B), camera
❽ screw (B2×4)
❸ flexible connector CN804
❽ screw (B2×4)
❷ FP-92 flexible board
❶ flexible connector CN613
❿ VC-32P board
❼ screw (B2×4)
❽ screw (B2×4)
❺ connector CN701 (white) 5P
❻ camera shield case (upper)
❹ FP-95 flexible board

2-11. REMOVAL OF CCD IMAGER AND DC-DC CONVERTER

1) Take off the insulator, CD ❶.
2) Remove the FP-92 flexible board ❸ from the flexible connector ❷. (At this time, take off the soldering to the shield case.)
3) Remove the two screws ❹ and the CCD imager ❺.
4) Remove the connector ❻ and the screw ❼.
5) Remove the DC-DC converter ❽ in the direction shown by the arrow Ⓐ. (for fitting insert Ⓑ part in the Ⓒ part.)


❸ FP-92 flexible board
❷ flexible connector CN613
Ⓒ
❹ screws (B2×14)
Ⓑ
Ⓐ
❶ insulator, CD
❽ DC-DC converter.
❺ CCD imager
❼ screw (B2×4)
❻ connector CN701 (white) 5P

2-12. REMOVAL OF CASSETTE COMPARTMENT HOLDER ASSEMBLY

1) Set the status to USE mode.
   (To set to USE , refer to "1-4 Operation of Mode Selector" in FL Mechanism (Q Mechanism) of Adjustment Guide for 8mm Video Camera Recorder Mechanism.)
2) Remove support, LS ❷ by removing the screw ❶.
3) Remove frame assy, LS ❹ by removing the four screws ❸.
4) Remove the washer ❻, bar, joint ❼, protector assy, T ❽ and arm assy, TP ❾ by removing three washers ❺.
5) Remove two shaft A, arm ⓫ by removing two screws ❿.
6) Remove the shafts from the long hole ⓬ and after turning the cassette compartment holder assembly ⓭ to the arrowed Ⓐ direction, remove the cassette compartment holder assembly ⓭ by removing the long holes from the shaft in the order of ⓮ and ⓯.
7) Slide holder, BS ⓰ to the arrowed Ⓑ direction as shown in Fig. 1 and remove the holder to the arrowed Ⓒ direction.

Note: In this case, take care not to drop the steel balls and a spring, compression within holder, BS ⓰.

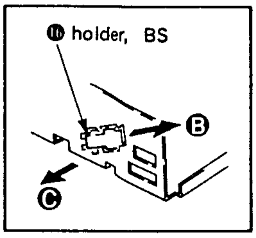
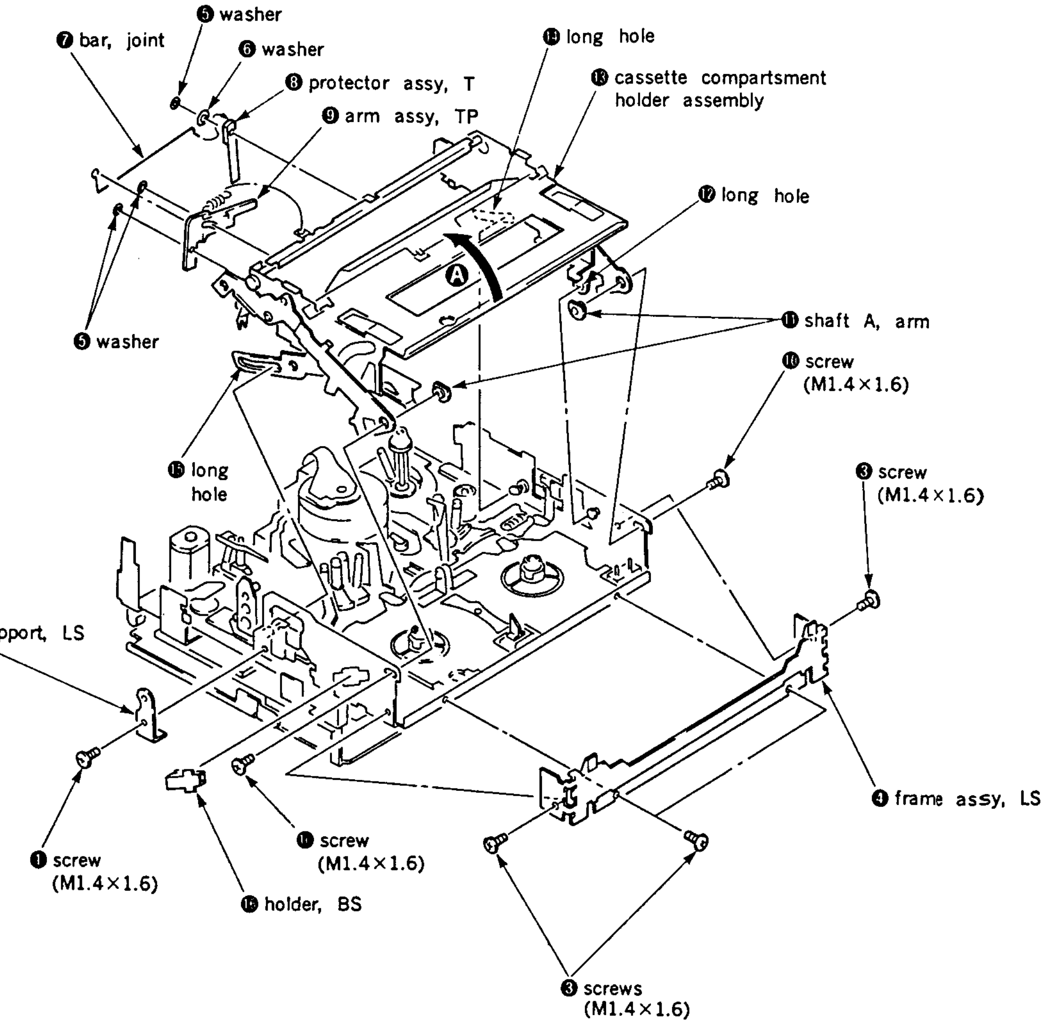
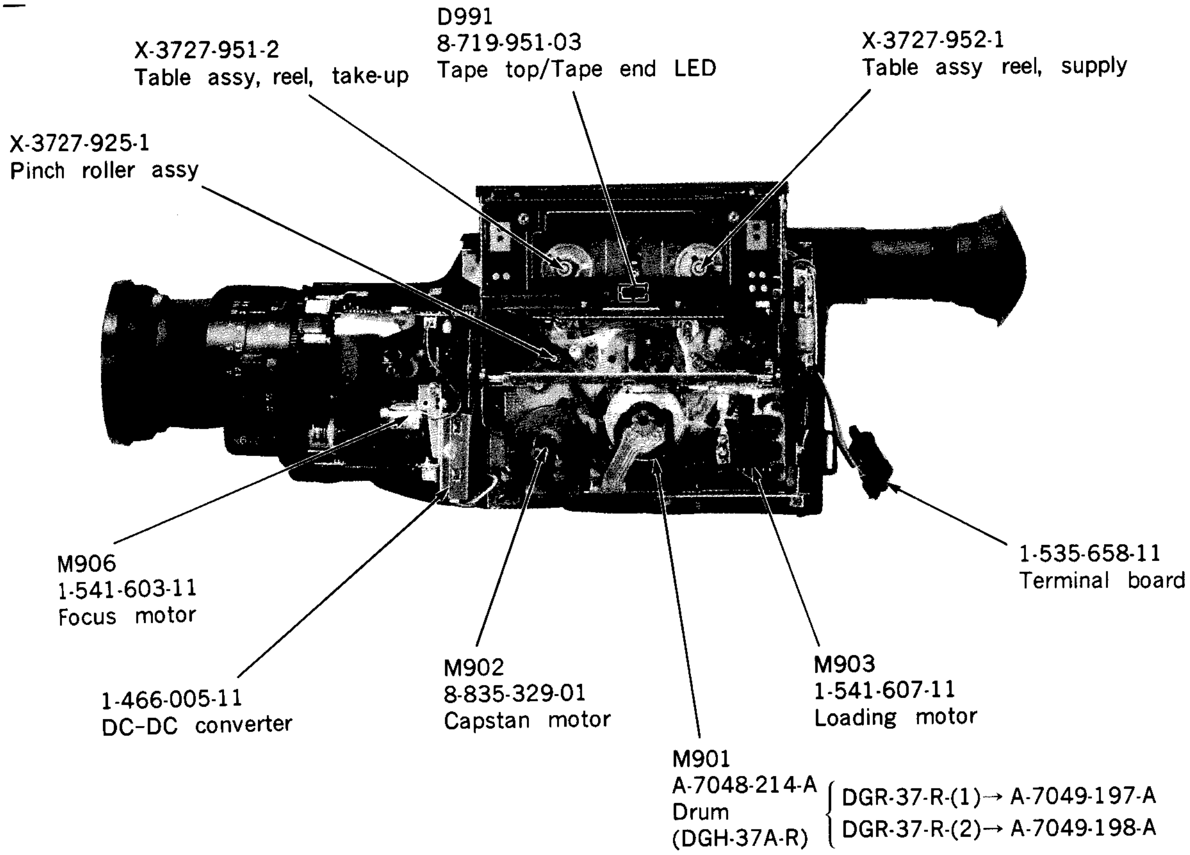


Fig. 1

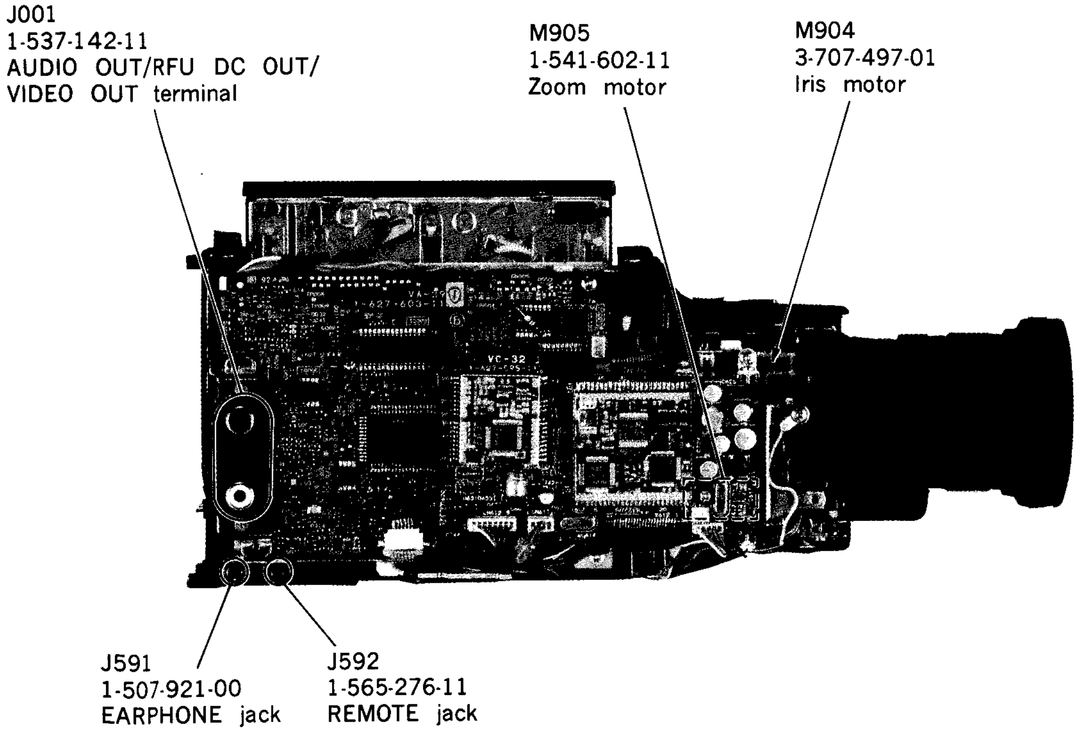

❺ washer
❼ bar, joint
❻ washer
❽ protector assy, T
❾ arm assy, TP
⓮ long hole
⓭ cassette compartsment holder assembly
⓬ long hole
Ⓐ
❺ washer
⓫ shaft A, arm
❿ screw (M1.4×1.6)
⓯ long hole
❸ screw (M1.4×1.6)
❷ support, LS
❹ frame assy, LS
❶ screw (M1.4×1.6)
❶ screw (M1.4×1.6)
⓰ holder, BS
❸ screws (M1.4×1.6)

2-13. INTERNAL VIEWS

—Upper—

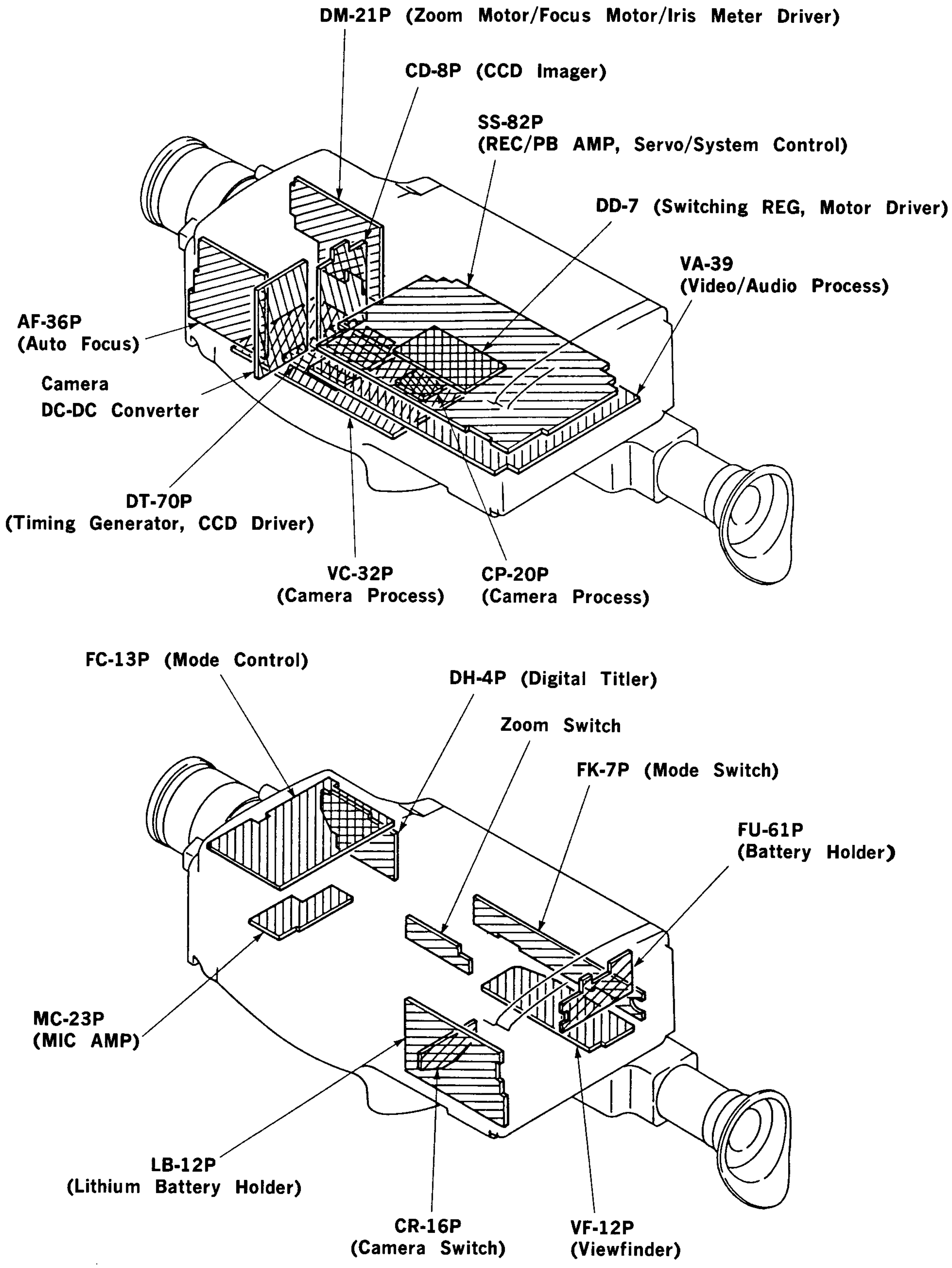

X-3727-951-2
Table assy, reel, take-up
D991
8-719-951-03
Tape top/Tape end LED
X-3727-952-1
Table assy reel, supply
X-3727-925-1
Pinch roller assy
1-535-658-11
Terminal board
M906
1-541-603-11
Focus motor
1-466-005-11
DC-DC converter
M902
8-835-329-01
Capstan motor
M903
1-541-607-11
Loading motor
M901
A-7048-214-A
Drum
(DGH-37A-R)
DGR-37-R-(1)→ A-7049-197-A
DGR-37-R-(2)→ A-7049-198-A

—Lower—

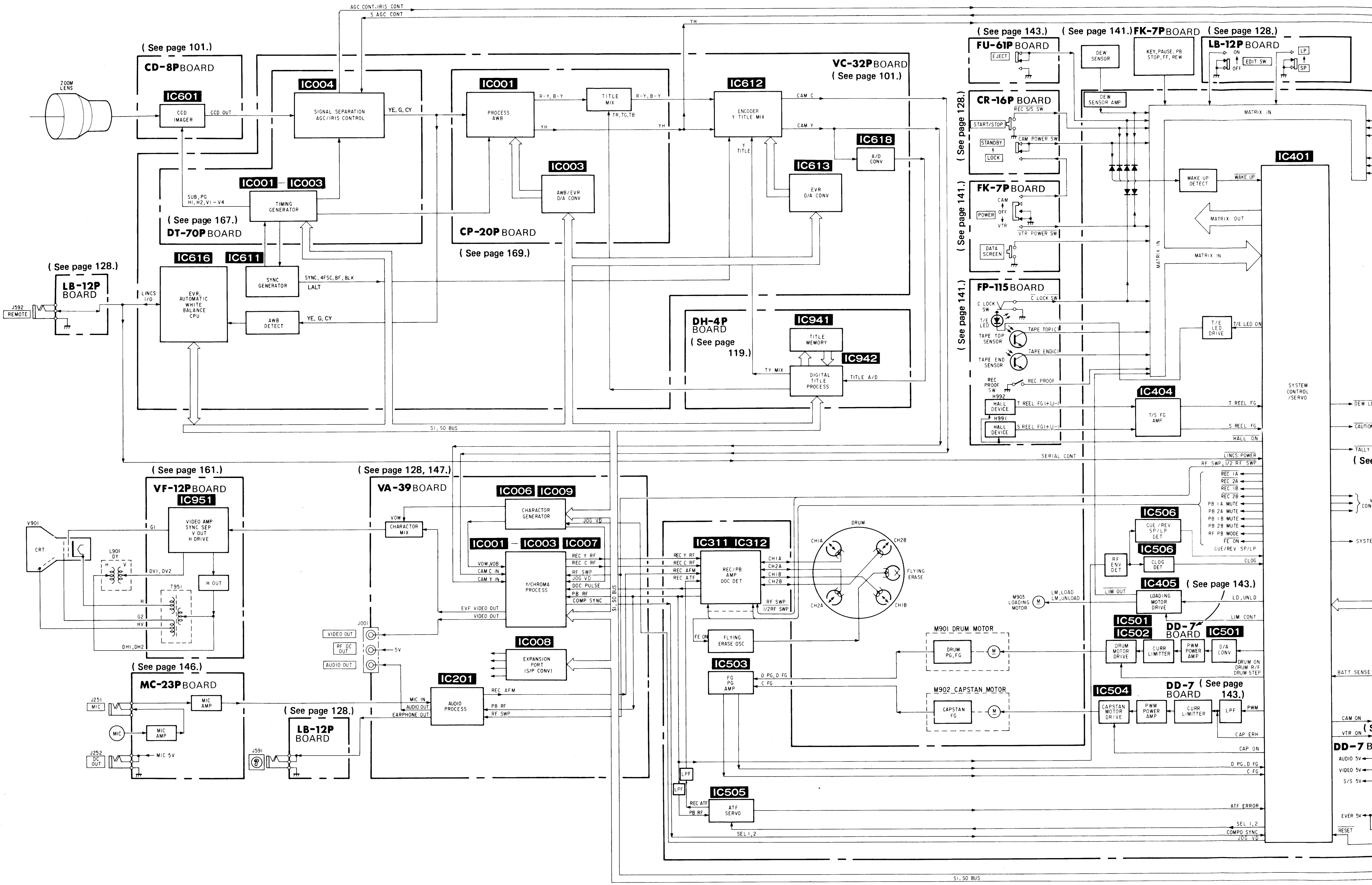

J001
1-537-142-11
AUDIO OUT/RFU DC OUT/
VIDEO OUT terminal
M905
1-541-602-11
Zoom motor
M904
3-707-497-01
Iris motor
J591
1-507-921-00
EARPHONE jack
J592
1-565-276-11
REMOTE jack

SECTION 3
DIAGRAMS

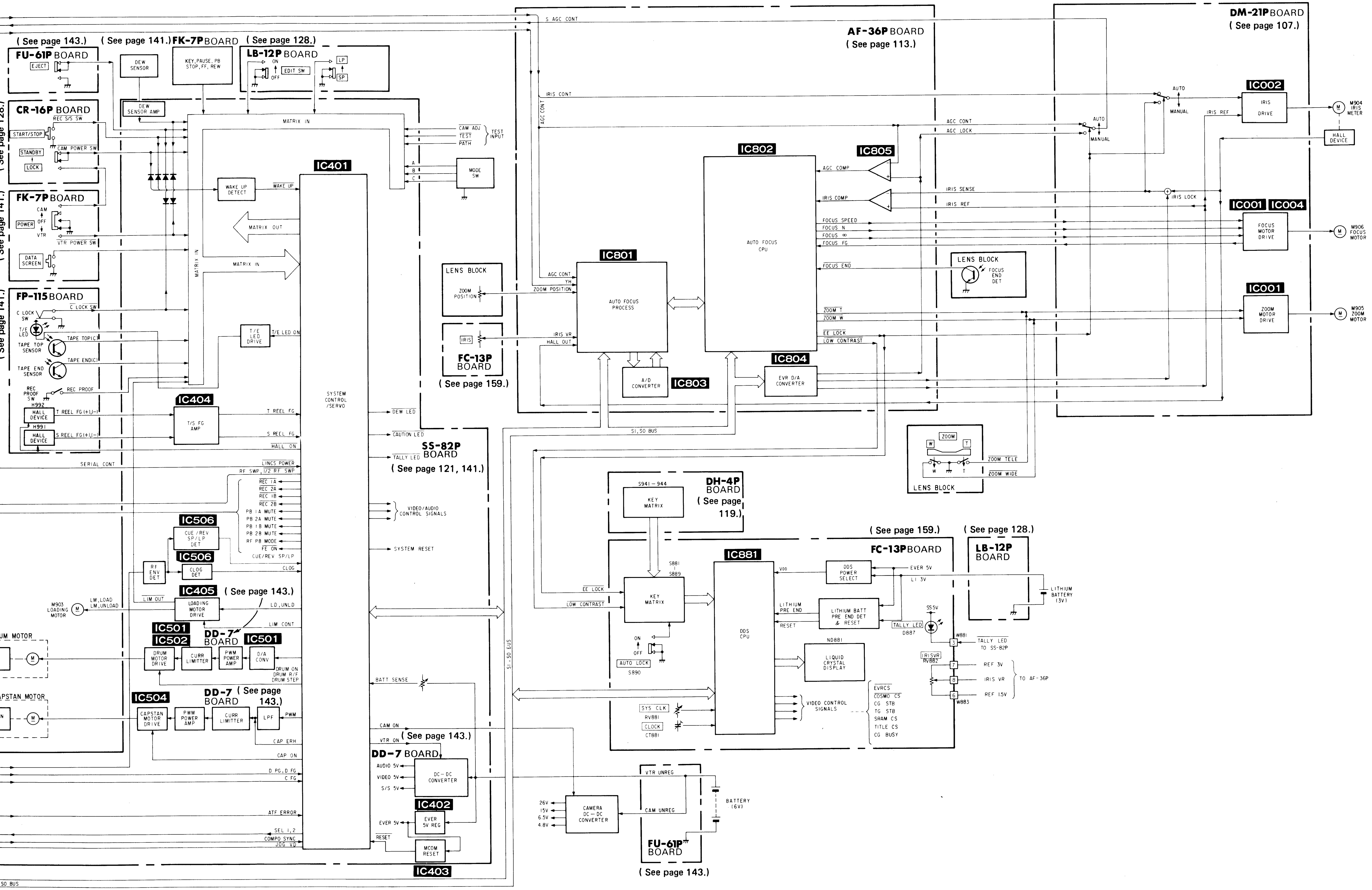
3-1. CIRCUIT BOARDS LOCATION


DM-21P (Zoom Motor/Focus Motor/Iris Meter Driver)
CD-8P (CCD Imager)
SS-82P
(REC/PB AMP, Servo/System Control)
DD-7 (Switching REG, Motor Driver)
VA-39
(Video/Audio Process)
AF-36P
(Auto Focus)
Camera
DC-DC Converter
DT-70P
(Timing Generator, CCD Driver)
VC-32P
(Camera Process)
CP-20P
(Camera Process)
FC-13P (Mode Control)
DH-4P (Digital Titler)
Zoom Switch
FK-7P (Mode Switch)
FU-61P
(Battery Holder)
MC-23P
(MIC AMP)
LB-12P
(Lithium Battery Holder)
CR-16P
(Camera Switch)
VF-12P
(Viewfinder)

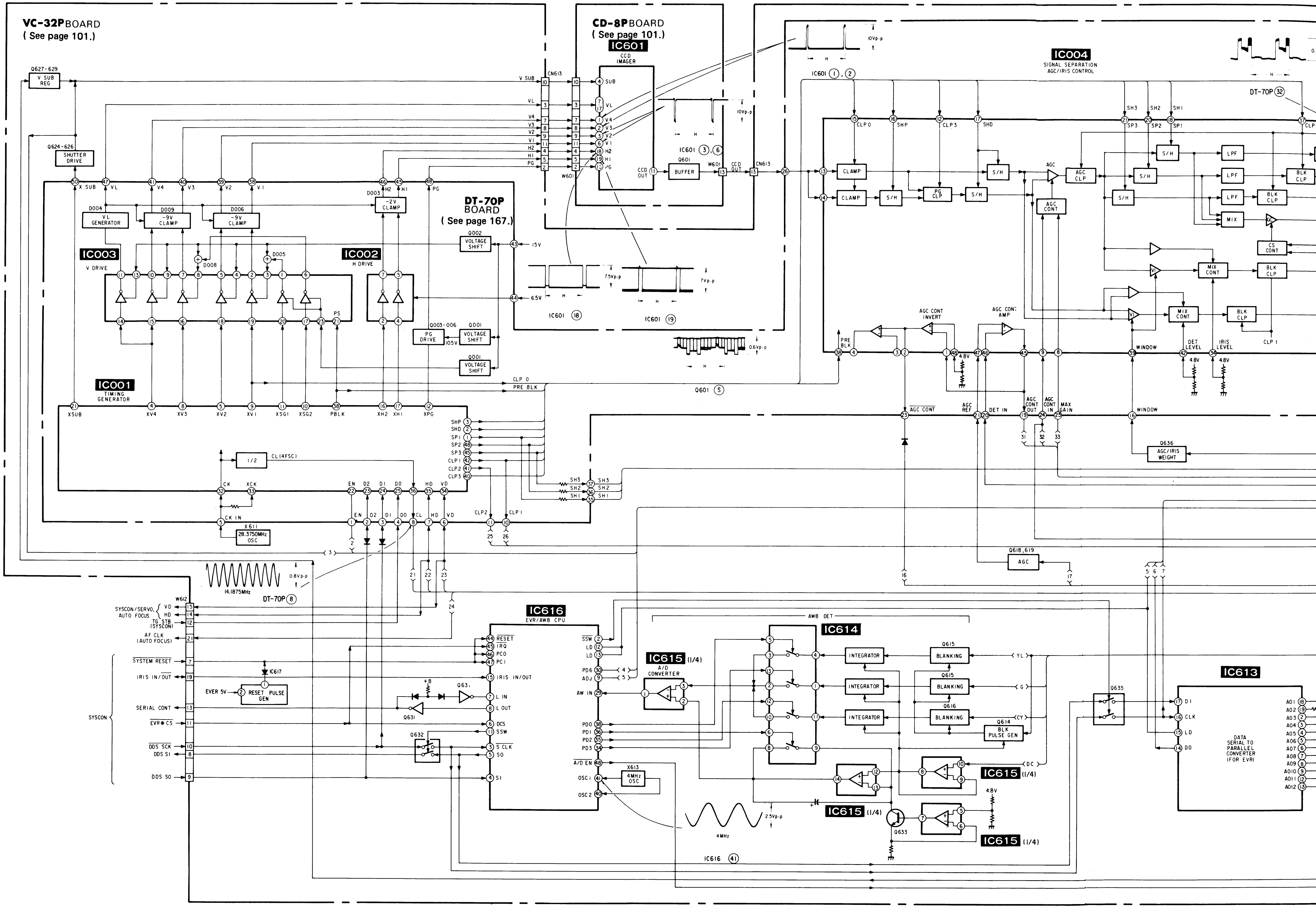
3-2. OVERALL BLOCK DIAGRAM

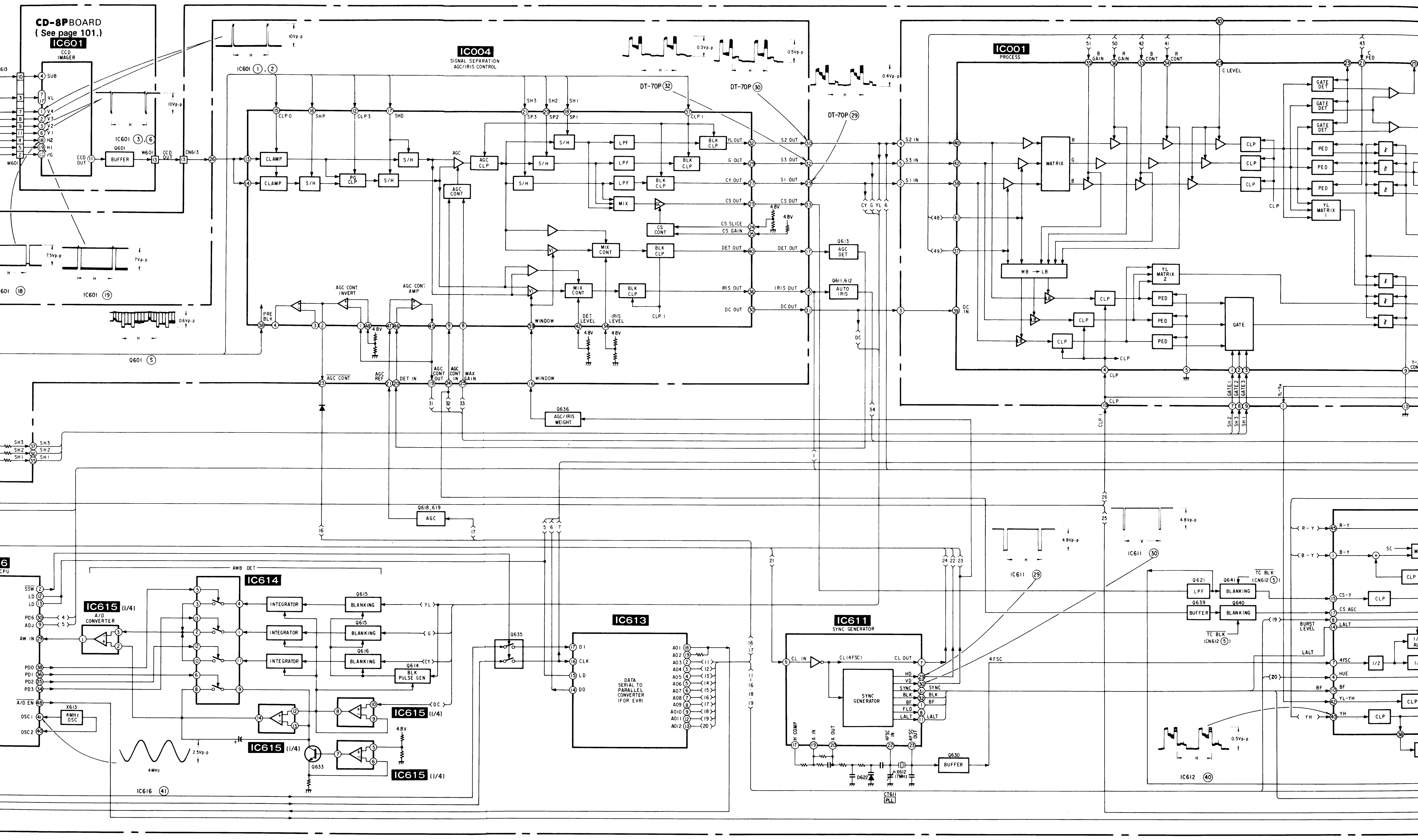


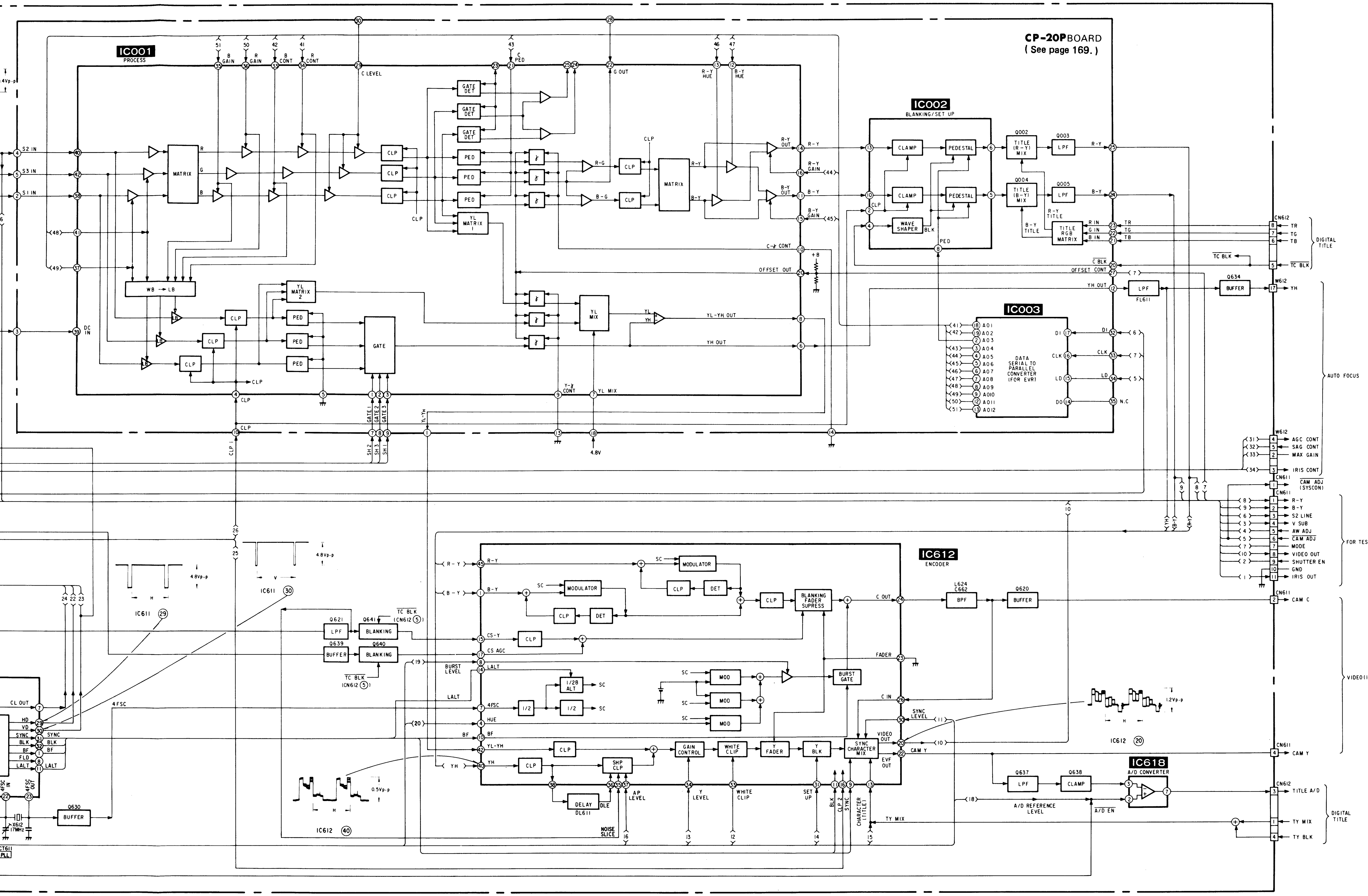
AGC CONT, IRIS CONT
S AGC CONT
YH
(See page 101.)
CD-8P BOARD
IC601
CCD IMAGER
CCD OUT
ZOOM LENS
IC004
SIGNAL SEPARATION AGC/IRIS CONTROL
YE, G, CY
IC001
PROCESS AWB
R-Y, B-Y
TITLE MIX
TR, TG, TB
IC612
ENCODER Y TITLE MIX
CAM C
CAM Y
VC-32P BOARD
(See page 101.)
IC618
A/D CONV
IC613
EVR D/A CONV
IC003
AWB/EVR D/A CONV
IC001 – IC003
TIMING GENERATOR
SUB, PG
H1, H2, V1 – V4
(See page 167.)
DT-70P BOARD
CP-20P BOARD
(See page 169.)
Y TITLE
(See page 128.)
LB-12P BOARD
J592 REMOTE
LINCS I/O
IC616
IC611
EVR, AUTOMATIC WHITE BALANCE CPU
SYNC GENERATOR
SYNC, 4FSC, BF, BLK
LALT
AWB DETECT
YE, G, CY
DH-4P BOARD
(See page 119.)
IC941
TITLE MEMORY
IC942
DIGITAL TITLE PROCESS
TY MIX
TITLE A/D
SI, SO BUS
(See page 143.)
FU-61P BOARD
EJECT
(See page 141.) FK-7P BOARD
DEW SENSOR
KEY, PAUSE, PB STOP, FF, REW
(See page 128.)
LB-12P BOARD
ON
OFF
EDIT SW
LP
SP
DEW SENSOR AMP
(See page 128.)
CR-16P BOARD
REC S/S SW
START/STOP
STANDBY
LOCK
CAM POWER SW
MATRIX IN
(See page 141.)
FK-7P BOARD
CAM
POWER
OFF
VTR
VTR POWER SW
DATA SCREEN
WAKE UP DETECT
WAKE UP
MATRIX OUT
MATRIX IN
IC401
(See page 141.)
FP-115 BOARD
C LOCK SW
T/E LED
TAPE TOP SENSOR
TAPE TOP(C)
TAPE END SENSOR
TAPE END(C)
REC PROOF SW
REC PROOF
H992
HALL DEVICE
T REEL FG (+), (–)
H991
HALL DEVICE
S REEL FG (+), (–)
T/E LED DRIVE
T/E LED ON
IC404
T/S FG AMP
T REEL FG
S REEL FG
HALL ON
SYSTEM CONTROL /SERVO
DEW L
CAUTION
TALLY
(See
LINCS POWER
SERIAL CONT
RF SWP, 1/2 RF SWP
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
RF PB MODE
FE ON
CUE/REV SP/LP
CLOG
CON
SYSTE
(See page 161.)
VF-12P BOARD
IC951
VIDEO AMP SYNC SEP V OUT H DRIVE
V901
CRT
G1
L901 DY
H V
DV1, DV2
H OUT
T951
H
G2
HV
DH1, DH2
(See page 128, 147.)
VA-39 BOARD
IC006 IC009
CHARACTER GENERATOR
JOG VD
VOW
CHARACTER MIX
IC001 – IC003 IC007
VOW, VOB
CAM C IN
CAM Y IN
Y/CHROMA PROCESS
REC Y RF
REC C RF
RF SWP
JOG VD
DOC PULSE
PB RF
COMP SYNC
EVF VIDEO OUT
VIDEO OUT
J001
VIDEO OUT
RF DC OUT
AUDIO OUT
5V
IC008
EXPANSION PORT (S/P CONV)
IC201
AUDIO PROCESS
MIC IN
AUDIO OUT
EARPHONE OUT
REC AFM
PB RF
RF SWP
SI, SO BUS
(See page 146.)
MC-23P BOARD
J251 MIC
MIC AMP
MIC
MIC AMP
J252 DC OUT
MIC 5V
(See page 128.)
LB-12P BOARD
J591
IC311 IC312
REC Y RF
REC C RF
REC AFM
REC ATF
REC/PB AMP DOC DET
CH1A
CH2A
CH1B
CH2B
RF SWP
1/2RF SWP
DRUM
FLYING ERASE
FE ON
FLYING ERASE OSC
IC503
FG PG AMP
D PG, D FG
C FG
LPF
LPF
IC505
REC ATF
PB RF
ATF SERVO
SEL 1, 2
IC506
CUE/REV SP/LP DET
IC506
CLOG DET
RF ENV DET
LIM OUT
IC405
(See page 143.)
LOADING MOTOR DRIVE
LD, UNLD
M903 LOADING MOTOR
LM, LOAD
LM, UNLOAD
LIM CONT
M901 DRUM MOTOR
DRUM PG, FG
IC501
IC502
DD-7 BOARD
IC501
DRUM MOTOR DRIVE
CURR LIMITTER
PWM POWER AMP
D/A CONV
DRUM ON
DRUM R/F
DRUM STEP
M902 CAPSTAN MOTOR
CAPSTAN FG
IC504
DD-7 BOARD
(See page 143.)
CAPSTAN MOTOR DRIVE
PWM POWER AMP
CURR LIMITTER
LPF
PWM
CAP ERR
CAP ON
D PG, D FG
C FG
ATF ERROR
SEL 1, 2
COMPO SYNC
JOG VD
BATT SENSE
CAM ON
VTR ON
DD-7 B
AUDIO 5V
VIDEO 5V
S/S 5V
EVER 5V
RESET
SI, SO BUS


(See page 143.)
FU-61P BOARD
EJECT
(See page 141.)
FK-7P BOARD
KEY,PAUSE, PB STOP, FF, REW
DEW SENSOR
DEW SENSOR AMP
(See page 128.)
LB-12P BOARD
EDIT SW
LP
SP
CR-16P BOARD
REC S/S SW
START/STOP
STANDBY
LOCK
CAM POWER SW
FK-7P BOARD
POWER
CAM
OFF
VTR
VTR POWER SW
DATA SCREEN
FP-115 BOARD
C LOCK SW
T/E LED
TAPE TOP SENSOR
TAPE END SENSOR
TAPE TOP
TAPE END
REC PROOF SW
REC PROOF
HALL DEVICE
H992
H991
T REEL FG (+),(-)
S REEL FG (+),(-)
SERIAL CONT
MATRIX IN
MATRIX OUT
WAKE UP DETECT
WAKE UP
T/E LED DRIVE
T/E LED ON
IC401
SYSTEM CONTROL /SERVO
CAM ADJ
TEST
PATH
TEST INPUT
MODE SW
IC404
T/S FG AMP
T REEL FG
S REEL FG
HALL ON
LINCS POWER
RF SWP, 1/2 RF SWP
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
RF PB MODE
FE ON
CUE/REV SP/LP
CLOG
IC506
CUE/REV SP/LP DET
RF ENV DET
CLOG DET
LIM OUT
IC405
(See page 143.)
LOADING MOTOR DRIVE
LD, UNLD
LIM CONT
M903 LOADING MOTOR
LM, LOAD
LM, UNLOAD
IC501
IC502
DD-7 BOARD
DRUM MOTOR DRIVE
CURR LIMITTER
PWM POWER AMP
D/A CONV
DRUM ON
DRUM R/F
DRUM STEP
UM MOTOR
APSTAN MOTOR
IC504
DD-7 BOARD
(See page 143.)
CAPSTAN MOTOR DRIVE
PWM POWER AMP
CURR LIMITTER
LPF
PWM
CAP ERH
CAP ON
D PG, D FG
C FG
ATF ERROR
SEL 1, 2
COMPO SYNC
JOG VD
SO BUS
DEW LED
CAUTION LED
TALLY LED
SS-82P BOARD
(See page 121, 141.)
VIDEO/AUDIO CONTROL SIGNALS
SYSTEM RESET
BATT SENSE
CAM ON
VTR ON
(See page 143.)
DD-7 BOARD
AUDIO 5V
VIDEO 5V
S/S 5V
DC-DC CONVERTER
IC402
EVER 5V
EVER 5V REG
RESET
MCOM RESET
IC403
SI, SO BUS
LENS BLOCK
ZOOM POSITION
IRIS
FC-13P BOARD
(See page 159.)
AF-36P BOARD
(See page 113.)
S AGC CONT
IRIS CONT
AGC CONT
AGC CONT
YH
ZOOM POSITION
IRIS VR
HALL OUT
IC801
AUTO FOCUS PROCESS
IC802
AUTO FOCUS CPU
A/D CONVERTER
IC803
IC804
EVR D/A CONVERTER
IC805
AGC COMP
IRIS COMP
FOCUS SPEED
FOCUS N
FOCUS ∞
FOCUS FG
FOCUS END
ZOOM T
ZOOM W
EE LOCK
LOW CONTRAST
SI, SO BUS
AGC CONT
AGC LOCK
IRIS SENSE
IRIS REF
IRIS LOCK
LENS BLOCK
FOCUS END DET
AUTO
MANUAL
DM-21P BOARD
(See page 107.)
IC002
IRIS DRIVE
IRIS REF
M904 IRIS METER
HALL DEVICE
IC001
IC004
FOCUS MOTOR DRIVE
M906 FOCUS MOTOR
IC001
ZOOM MOTOR DRIVE
M905 ZOOM MOTOR
LENS BLOCK
ZOOM
W
T
ZOOM TELE
ZOOM WIDE
DH-4P BOARD
(See page 119.)
S941 – 944
KEY MATRIX
(See page 159.)
FC-13P BOARD
IC881
S881 – S889
EE LOCK
LOW CONTRAST
KEY MATRIX
ON
OFF
AUTO LOCK
S890
DDS CPU
VDD
DDS POWER SELECT
EVER 5V
LI 3V
LITHIUM PRE END
LITHIUM BATT PRE END DET & RESET
RESET
TALLY LED
D887
SS5V
ND881
LIQUID CRYSTAL DISPLAY
VIDEO CONTROL SIGNALS
EVRCS
COSMO CS
CG STB
TG STB
SRAM CS
TITLE CS
CG BUSY
SYS CLK
RV881
CLOCK
CT881
IRISVR
RV882
W881
W883
TALLY LED TO SS-82P
REF 3V
IRIS VR
REF 1.5V
TO AF-36P
(See page 128.)
LB-12P BOARD
LITHIUM BATTERY (3V)
26V
15V
6.5V
4.8V
CAMERA DC-DC CONVERTER
VTR UNREG
CAM UNREG
BATTERY (6V)
FU-61P BOARD
(See page 143.)

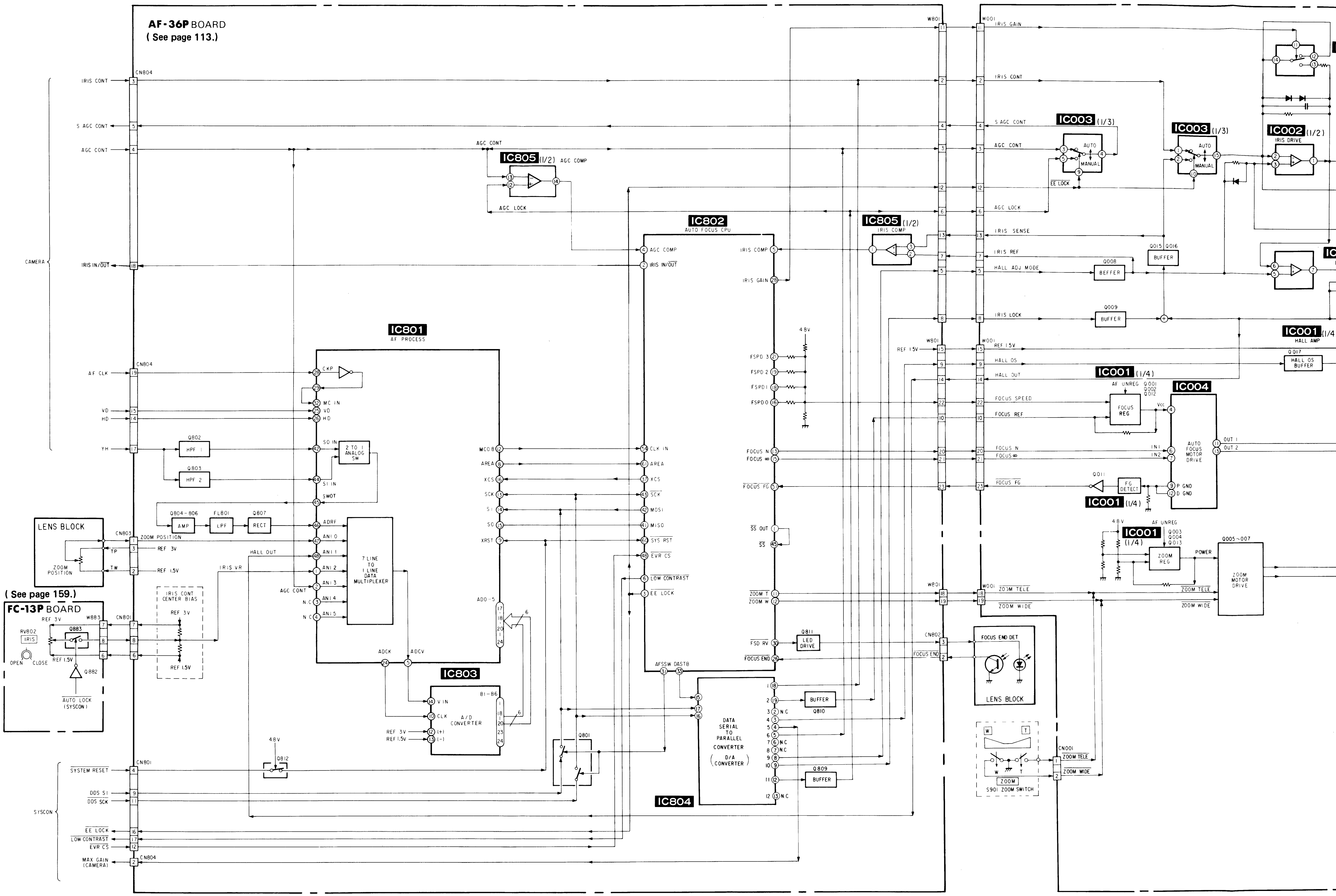
3-3. CAMERA BLOCK DIAGRAM


VC-32P BOARD
(See page 101.)
CD-8P BOARD
(See page 101.)
IC601
CCD IMAGER
DT-70P BOARD
(See page 167.)
IC004
SIGNAL SEPARATION AGC/IRIS CONTROL
IC003
V DRIVE
IC002
H DRIVE
IC001
TIMING GENERATOR
Q627-629
V SUB REG
Q624-626
SHUTTER DRIVE
D004
VL GENERATOR
D009
-9V CLAMP
D006
-9V CLAMP
D003
-2V CLAMP
Q002
VOLTAGE SHIFT
Q001
VOLTAGE SHIFT
Q003-006
PG DRIVE
Q601
BUFFER
CN613
W601
CCD OUT
X611
28.3750MHz OSC
1/2
CL(4FSC)
14.1875MHz
DT-70P ⑧
0.8Vp-p
10Vp-p
7.5Vp-p
7Vp-p
0.6Vp-p
IC601 ①, ②
IC601 ③, ⑥
IC601 ⑱
IC601 ⑲
Q601 Ⓢ
DT-70P ㉜
CLAMP
S/H
PG CLP
AGC
AGC CLP
AGC CONT
LPF
BLK CLP
MIX
CS CONT
MIX CONT
AGC CONT INVERT
AGC CONT AMP
PRE BLK
WINDOW
DET LEVEL
IRIS LEVEL
4.8V
Q636
AGC/IRIS WEIGHT
Q618,619
AGC
IC616
EVR/AWB CPU
IC614
IC615 (1/4)
A/D CONVERTER
INTEGRATOR
Q615
BLANKING
Q616
Q614
BLK PULSE GEN
Q633
4MHz
2.5Vp-p
X613
4MHz OSC
IC616 ㊶
IC617
RESET PULSE GEN
EVER 5V
Q631
Q632
Q635
IC613
DATA SERIAL TO PARALLEL CONVERTER (FOR EVR)
AWB DET
W612
SYSCON/SERVO, AUTO FOCUS
VD
HD
TG STB (SYSCON)
AF CLK (AUTO FOCUS)
SYSCON
SYSTEM RESET
IRIS IN/OUT
SERIAL CONT
EVR✱CS
DDS SCK
DDS SI
DDS SO

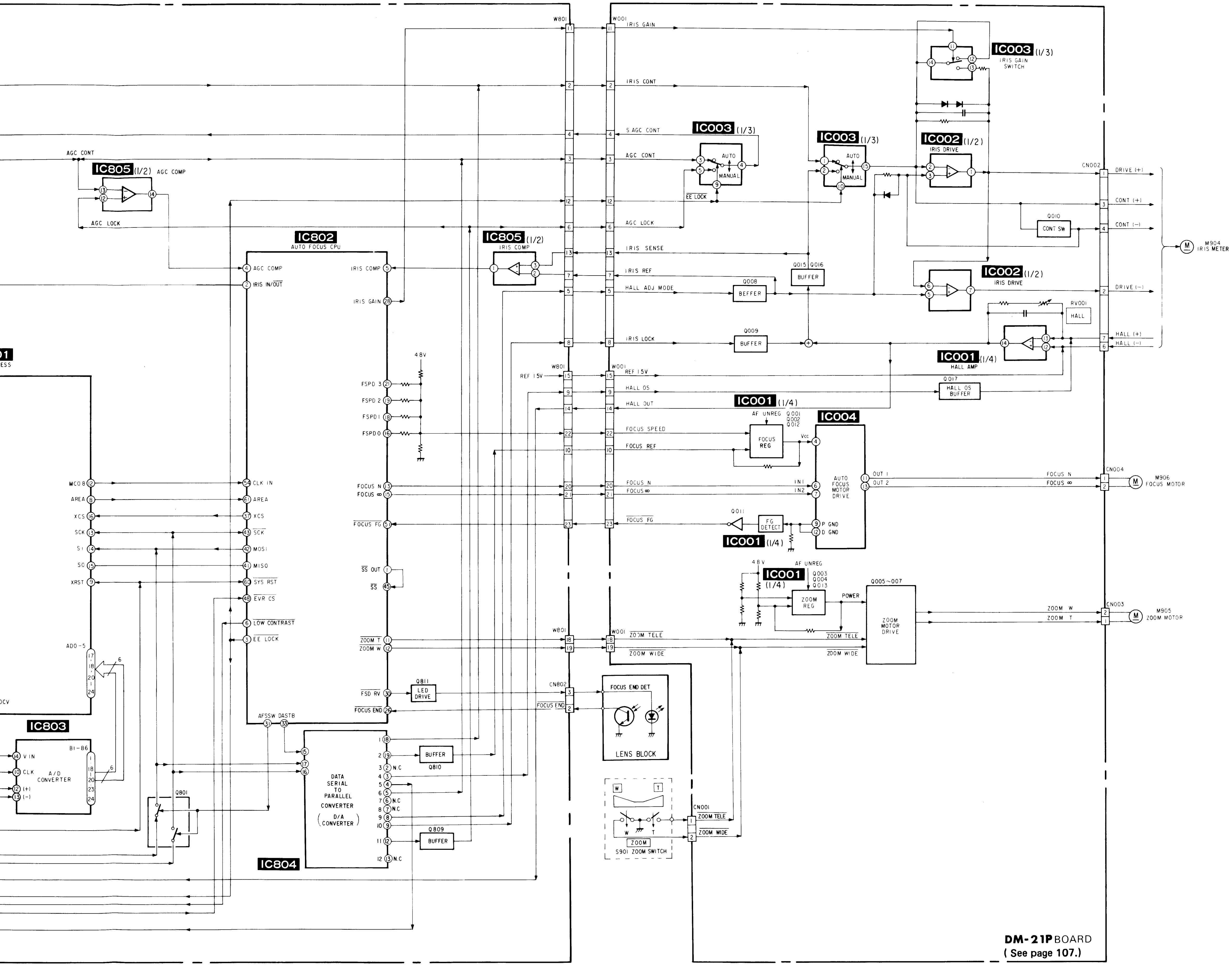

CD-8P BOARD
(See page 101.)
IC601
CCD IMAGER
SUB
VL
V4
V3
V2
V1
H2
H1
PG
CCD OUT
Q601
BUFFER
W601
CCD OUT
CN613
IC004
SIGNAL SEPARATION AGC/IRIS CONTROL
IC601 ①, ②
IC601 ③, ⑥
CLAMP
S/H
PG CLP
AGC
AGC CLP
AGC CONT
LPF
BLK CLP
MIX
CS CONT
MIX CONT
CLP O
SHP
CLP 3
SHD
SH3
SH2
SH1
SP3
SP2
SP1
CLP 1
YL OUT
G OUT
CY OUT
CS OUT
CS SLICE
CS GAIN
DET OUT
IRIS OUT
DC OUT
PRE BLK
AGC CONT INVERT
AGC CONT AMP
WINDOW
DET LEVEL
IRIS LEVEL
4.8V
DT-70P ㉜
DT-70P ㉚
DT-70P ㉙
S2 OUT
S3 OUT
S1 OUT
Q613
AGC DET
Q611,612
AUTO IRIS
AGC CONT
AGC REF
DET IN
AGC CONT OUT
AGC CONT IN
MAX GAIN
Q636
AGC/IRIS WEIGHT
Q618,619
AGC
10Vp-p
7.5Vp-p
7Vp-p
0.3Vp-p
0.5Vp-p
0.4Vp-p
0.6Vp-p
IC601 ⑱
IC601 ⑲
Q601 ⑤
IC001
PROCESS
B GAIN
R GAIN
B CONT
R CONT
C LEVEL
C PED
S2 IN
S3 IN
S1 IN
MATRIX
CLP
GATE DET
PED
YL MATRIX 1
YL MATRIX 2
WB → LB
LB
GATE
DC IN
GATE 1
GATE 2
GATE 3
YL-YH
CY G YL 6
IC614
AWB DET
INTEGRATOR
Q615
BLANKING
Q616
Q614
BLK PULSE GEN
IC615 (1/4)
A/D CONVERTER
CPU
SSW
LD
PD6
ADJ
AW IN
PD0
PD1
PD2
PD3
A/D EN
OSC 1
OSC 2
X613
4MHz OSC
4MHz
2.5Vp-p
IC616 ㊶
Q633
Q635
IC613
DATA SERIAL TO PARALLEL CONVERTER (FOR EVR)
DI
CLK
LD
DO
IC611
SYNC GENERATOR
CL IN
CL (4FSC)
CL OUT
HD
VD
SYNC
BLK
BF
FLD
LALT
H COMP
A IN
A OUT
4FSC IN
4FSC OUT
D622
X612 17MHz
CT611 PLL
Q630
BUFFER
IC611 ㉙
IC611 ㉚
4.8Vp-p
Q621
LPF
Q641
BLANKING
TC BLK (CN612 ⑤)
Q639
BUFFER
Q640
R-Y
B-Y
SC
CS-Y
CS AGC
BURST LEVEL
4FSC
1/2
HUE
YL-YH
YH
IC612 ㊵
0.5Vp-p


CP-20PBOARD
(See page 169.)
IC001
PROCESS
B GAIN
R GAIN
B CONT
R CONT
C LEVEL
C PED
G OUT
R-Y HUE
B-Y HUE
S2 IN
S3 IN
S1 IN
MATRIX
WB → LB
YL MATRIX 2
YL MATRIX 1
GATE DET
GATE
CLP
PED
YL MIX
YL-YH OUT
YH OUT
R-Y OUT
R-Y GAIN
B-Y OUT
B-Y GAIN
C-γ CONT
OFFSET OUT
DC IN
Y-γ CONT
GATE 1
GATE 2
GATE 3
SH 2
SH 3
SH 1
CLP 1
4.8V
IC002
BLANKING/SET UP
CLAMP
PEDESTAL
WAVE SHAPER
BLK
PED
Q002
TITLE (R-Y) MIX
Q003
LPF
Q004
TITLE (B-Y) MIX
Q005
R-Y TITLE
B-Y TITLE
TITLE RGB MATRIX
R IN
G IN
B IN
C BLK
OFFSET CONT
YH OUT
FL611
Q634
BUFFER
IC003
DATA SERIAL TO PARALLEL CONVERTER (FOR EVR)
A01 A02 A03 A04 A05 A06 A07 A08 A09 A010 A011 A012
DI
CLK
LD
DO
N.C
CN612
TR
TG
TB
TC BLK
DIGITAL TITLE
W612
YH
AUTO FOCUS
AGC CONT
SAG CONT
MAX GAIN
IRIS CONT
CN611
CAM ADJ (SYSCON)
CN611
R-Y
B-Y
S2 LINE
V SUB
AW ADJ
CAM ADJ
MODE
VIDEO OUT
SHUTTER EN
GND
IRIS OUT
FOR TEST
CAM C
VIDEO(1)
CAM Y
IC612
ENCODER
MODULATOR
DET
BLANKING FADER SUPRESS
C OUT
L624 C662
BPF
Q620
BUFFER
Q621
LPF
Q641
BLANKING
TC BLK (CN612 ⑤)
Q639
BUFFER
Q640
CS-Y
CS AGC
BURST LEVEL
LALT
1/2B ALT
SC
1/2
4FSC
HUE
BF
YL-YH
MOD
BURST GATE
FADER
C IN
SYNC LEVEL
VIDEO OUT
EVF OUT
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
SYNC CHARACTER MIX
DELAY DL611
DLE
NOISE SLICE
AP LEVEL
Y LEVEL
SET UP
BLK
CLP 2
SYNC
CHARACTER (TITLE)
TY MIX
A/D REFERENCE LEVEL
A/D EN
Q637
LPF
Q638
CLAMP
IC618
A/D CONVERTER
TITLE A/D
TY BLK
4.8Vp-p
IC611 ㉙
IC611 ㉚
1.2Vp-p
IC612 ⑳
0.5Vp-p
IC612 ㊵
CL OUT
HD
VD
SYNC
BLK
BF
FLD
LALT
4FSC IN
4FSC OUT
Q630
BUFFER
X612 17MHz
IC611 (PLL)
.4Vp-p

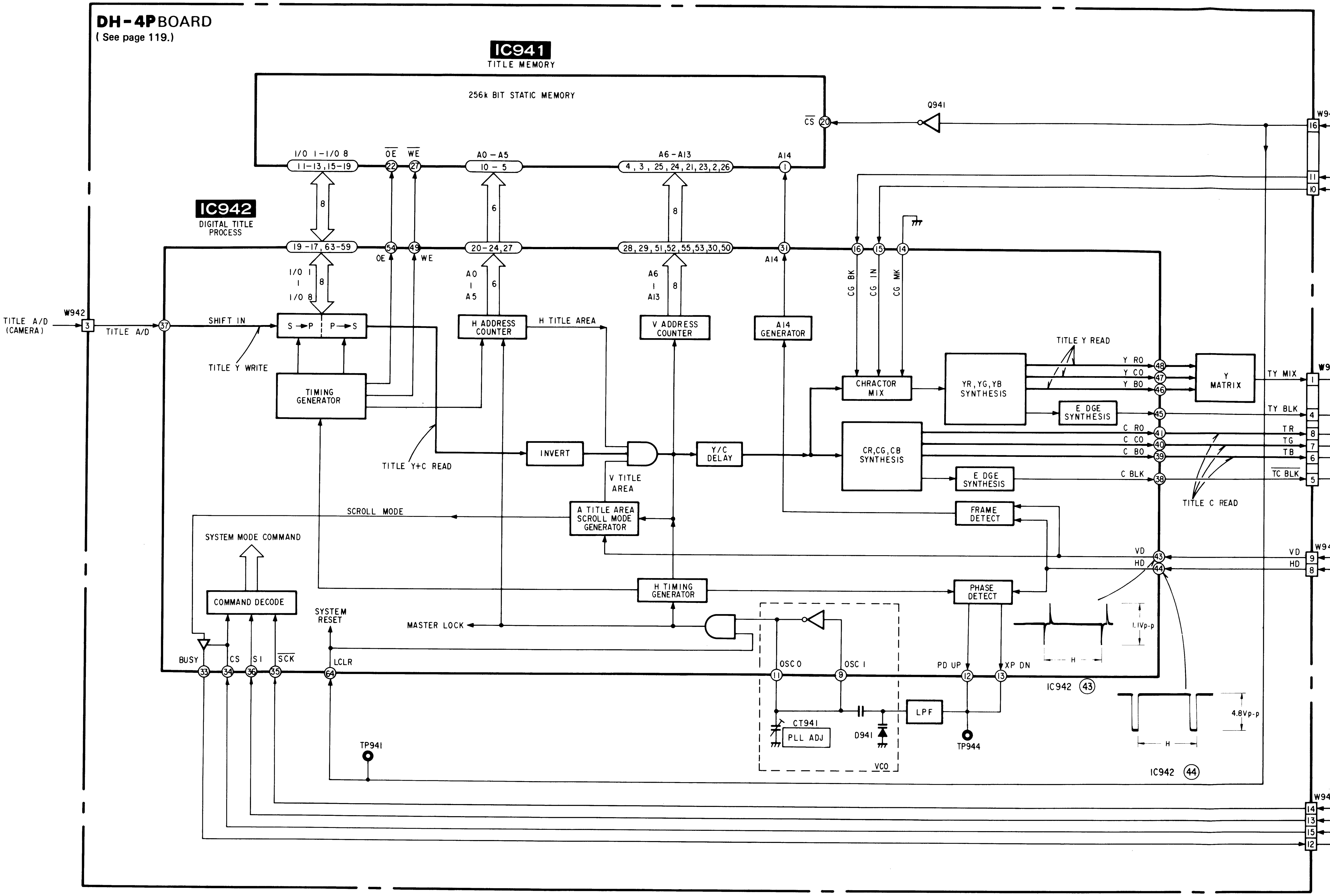
3-4. AUTO FOCUS BLOCK DIAGRAM

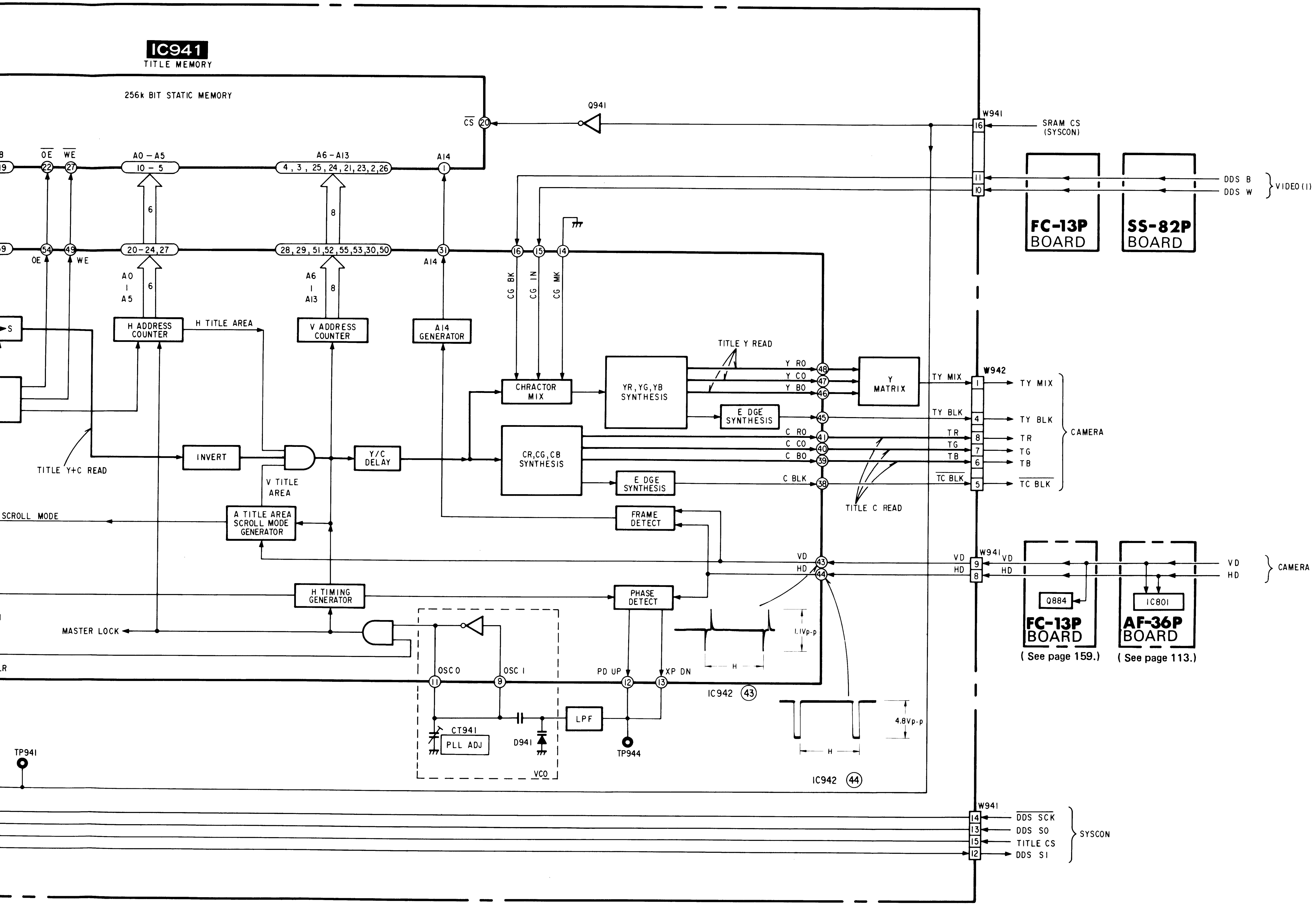


AF-36P BOARD
(See page 113.)
CN804
IRIS CONT
S AGC CONT
AGC CONT
CAMERA
IRIS IN/OUT
AF CLK
VD
HD
YH
AGC CONT
IC805 (1/2) AGC COMP
AGC LOCK
IC802
AUTO FOCUS CPU
AGC COMP
IRIS IN/OUT
IRIS COMP
IRIS GAIN
IC805 (1/2)
IRIS COMP
IC801
AF PROCESS
CKP
MC IN
VD
HD
Q802
HPF 1
Q803
HPF 2
SO IN
S1 IN
SWOT
2 TO 1 ANALOG SW
Q804-806
AMP
FL801
LPF
Q807
RECT
ADRF
AN1 0
AN1 1
AN1 2
AN1 3
AN1 4
AN1 5
N C
7 LINE TO 1 LINE DATA MULTIPLEXER
MCO 8
AREA
XCS
SCK
S1
SO
XRST
ADO-5
ADCK
ADCV
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
EE LOCK
4.8V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
FOCUS N
FOCUS ∞
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
FSD RV
FOCUS END
Q811
LED DRIVE
AFSSW
DASTB
IC803
VIN
CLK
A/D CONVERTER
REF 3V
REF 1.5V
B1-B6
LENS BLOCK
CN803
ZOOM POSITION
TP
TW
REF 3V
REF 1.5V
HALL OUT
IRIS VR
AGC CONT
IRIS CONT CENTER BIAS
(See page 159.)
FC-13P BOARD
REF 3V
W883
CN801
RV802
IRIS
OPEN
CLOSE
REF 1.5V
Q883
Q882
AUTO LOCK (SYSCON)
4.8V
Q812
Q801
SYSTEM RESET
DDS S1
DDS SCK
SYSCON
EE LOCK
LOW CONTRAST
EVR CS
MAX GAIN (CAMERA)
IC804
DATA SERIAL TO PARALLEL CONVERTER
(D/A CONVERTER)
BUFFER
Q810
Q809
BUFFER
N C
W801
W001
IRIS GAIN
IRIS CONT
S AGC CONT
AGC CONT
AGC LOCK
IRIS SENSE
IRIS REF
HALL ADJ MODE
IRIS LOCK
REF 1.5V
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM TELE
ZOOM WIDE
IC003 (1/3)
AUTO
MANUAL
EE LOCK
IC003 (1/3)
IC002 (1/2)
IRIS DRIVE
Q015 Q016
BUFFER
Q008
BEFFER
Q009
BUFFER
IC001 (1/4)
HALL AMP
Q017
HALL OS BUFFER
IC001 (1/4)
AF UNREG
Q001 Q002 Q012
FOCUS REG
Vcc
IC004
AUTO FOCUS MOTOR DRIVE
IN1
IN2
OUT 1
OUT 2
P GND
D GND
Q011
FG DETECT
IC001 (1/4)
4.8V
AF UNREG
IC001 (1/4)
Q003 Q004 Q013
ZOOM REG
POWER
Q005~007
ZOOM MOTOR DRIVE
ZOOM TELE
ZOOM WIDE
CN802
FOCUS END
FOCUS END DET
LENS BLOCK
W
T
ZOOM
S901 ZOOM SWITCH
CN001
ZOOM TELE
ZOOM WIDE

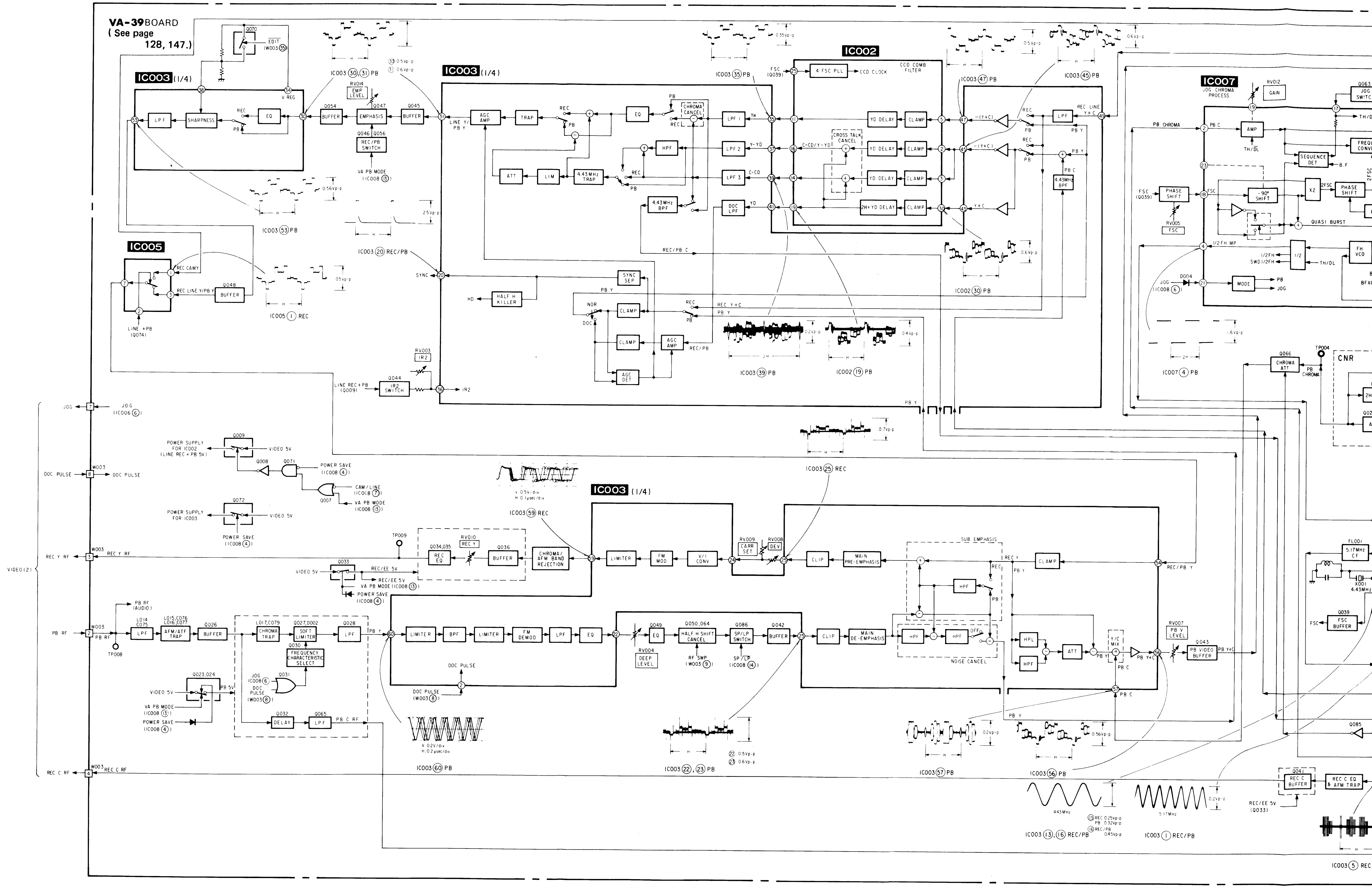

W801
W001
IRIS GAIN
IRIS CONT
S AGC CONT
AGC CONT
AGC LOCK
IRIS SENSE
IRIS REF
HALL ADJ MODE
IRIS LOCK
REF 15V
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM TELE
ZOOM WIDE
IC805 (1/2) AGC COMP
IC805 (1/2) IRIS COMP
IC802 AUTO FOCUS CPU
AGC COMP
IRIS IN/OUT
IRIS COMP
IRIS GAIN
FSPD 3
FSPD 2
FSPD 1
FSPD 0
4.8V
MCO 8
AREA
XCS
SCK
SI
SO
XRST
CLK IN
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
EE LOCK
SS OUT
SS
ZOOM T
ZOOM W
FSD RV
FOCUS END
AFSSW
DASTB
AD0-5
B1-B6
IC803
V IN
CLK
A/D CONVERTER
(+)
(-)
Q801
IC804
DATA SERIAL TO PARALLEL CONVERTER
(D/A CONVERTER)
N.C
BUFFER
Q810
Q809
Q811
LED DRIVE
CN802
FOCUS END DET
LENS BLOCK
S901 ZOOM SWITCH
ZOOM
W
T
CN001
IC003 (1/3)
IRIS GAIN SWITCH
AUTO
MANUAL
IC002 (1/2)
IRIS DRIVE
Q010
CONT SW
Q015 Q016
BUFFER
Q008
BEFFER
Q009
RV001
HALL
IC001 (1/4)
HALL AMP
Q017
HALL OS BUFFER
CN002
DRIVE (+)
CONT (+)
CONT (-)
DRIVE (-)
HALL (+)
HALL (-)
M904
IRIS METER
IC001 (1/4)
AF UNREG
Q001 Q002 Q012
FOCUS REG
Vcc
IC004
AUTO FOCUS MOTOR DRIVE
IN1
IN2
OUT 1
OUT 2
P GND
D GND
Q011
FG DETECT
CN004
M906
FOCUS MOTOR
Q003 Q004 Q013
ZOOM REG
POWER
Q005~007
ZOOM MOTOR DRIVE
ZOOM W
ZOOM T
CN003
M905
ZOOM MOTOR
M
DM-21P BOARD
(See page 107.)

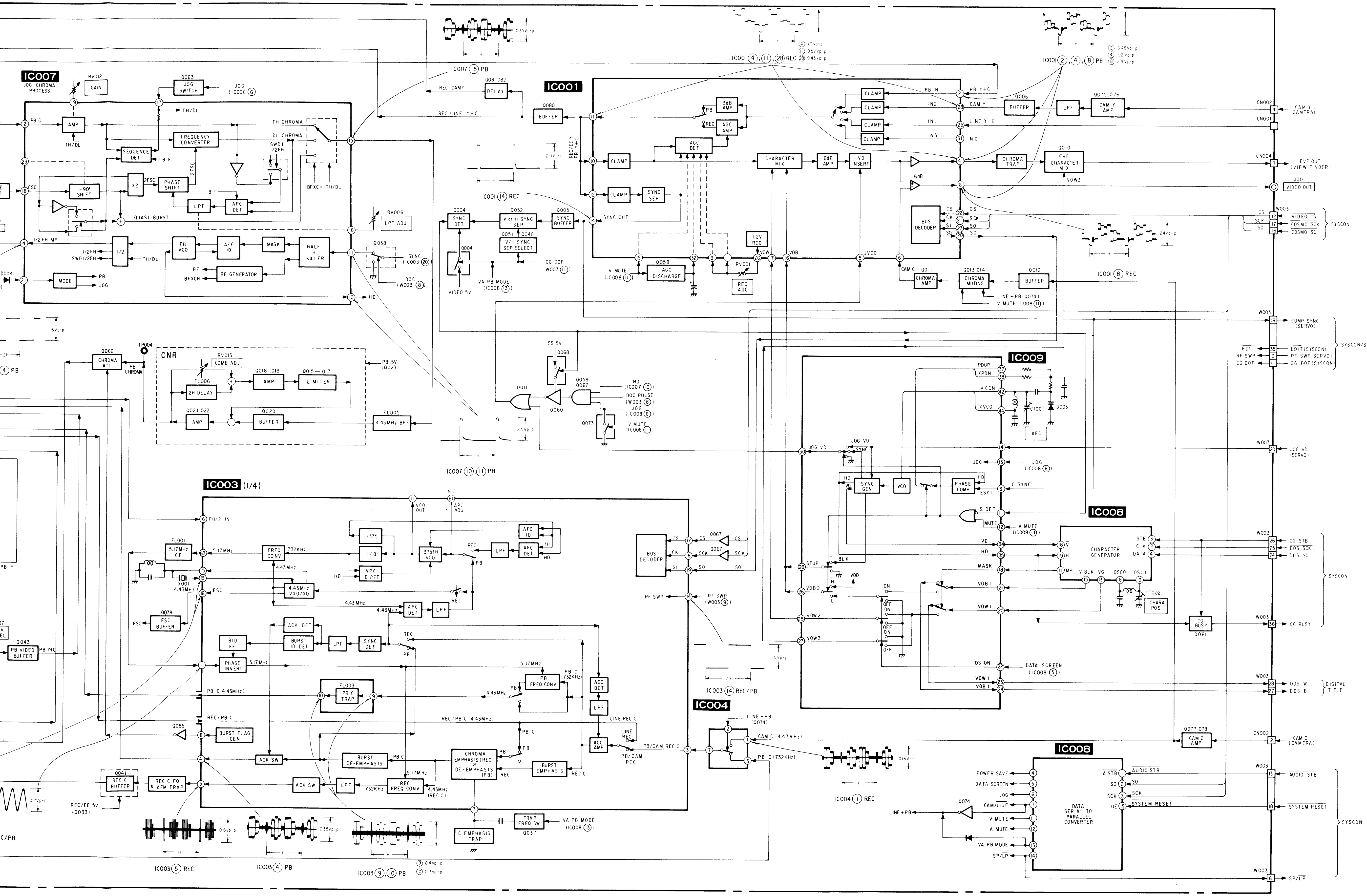
3-5. DIGITAL TITLER BLOCK DIAGRAM


DH-4P BOARD
(See page 119.)
IC941
TITLE MEMORY
256k BIT STATIC MEMORY
CS 20
Q941
I/O 1-I/O 8
11-13,15-19
OE 22
WE 27
A0 - A5
10 - 5
A6 - A13
4, 3, 25, 24, 21, 23, 2, 26
A14
1
IC942
DIGITAL TITLE PROCESS
19 -17, 63-59
54 OE
49 WE
20-24,27
28, 29, 51, 52, 55, 53, 30, 50
31 A14
16 15 14
CG BK
CG IN
CG MK
I/O 1 I I/O 8
8
6
A0 I A5
A6 I A13
TITLE A/D (CAMERA)
W942
3
TITLE A/D
37
SHIFT IN
S→P P→S
TITLE Y WRITE
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
TITLE Y READ
CHRACTOR MIX
YR, YG, YB SYNTHESIS
E DGE SYNTHESIS
Y RO 48
Y CO 47
Y BO 46
45
Y MATRIX
TY MIX
TY BLK
CR, CG, CB SYNTHESIS
C RO 41
C CO 40
C BO 39
C BLK 38
E DGE SYNTHESIS
TR
TG
TB
TC BLK
TITLE C READ
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
SCROLL MODE
A TITLE AREA SCROLL MODE GENERATOR
FRAME DETECT
VD 43
HD 44
VD
HD
SYSTEM MODE COMMAND
COMMAND DECODE
SYSTEM RESET
MASTER LOCK
H TIMING GENERATOR
PHASE DETECT
BUSY 33
CS 34
SI 36
SCK 35
LCLR 64
OSC O 11
OSC I 9
PD UP 12
XP DN 13
CT941
PLL ADJ
D941
VCO
LPF
TP941
TP944
1.1Vp-p
H
IC942 43
4.8Vp-p
H
IC942 44
W94
16
11
10
W9
1
4
8
7
6
5
W94
9
8
W94
14
13
15
12

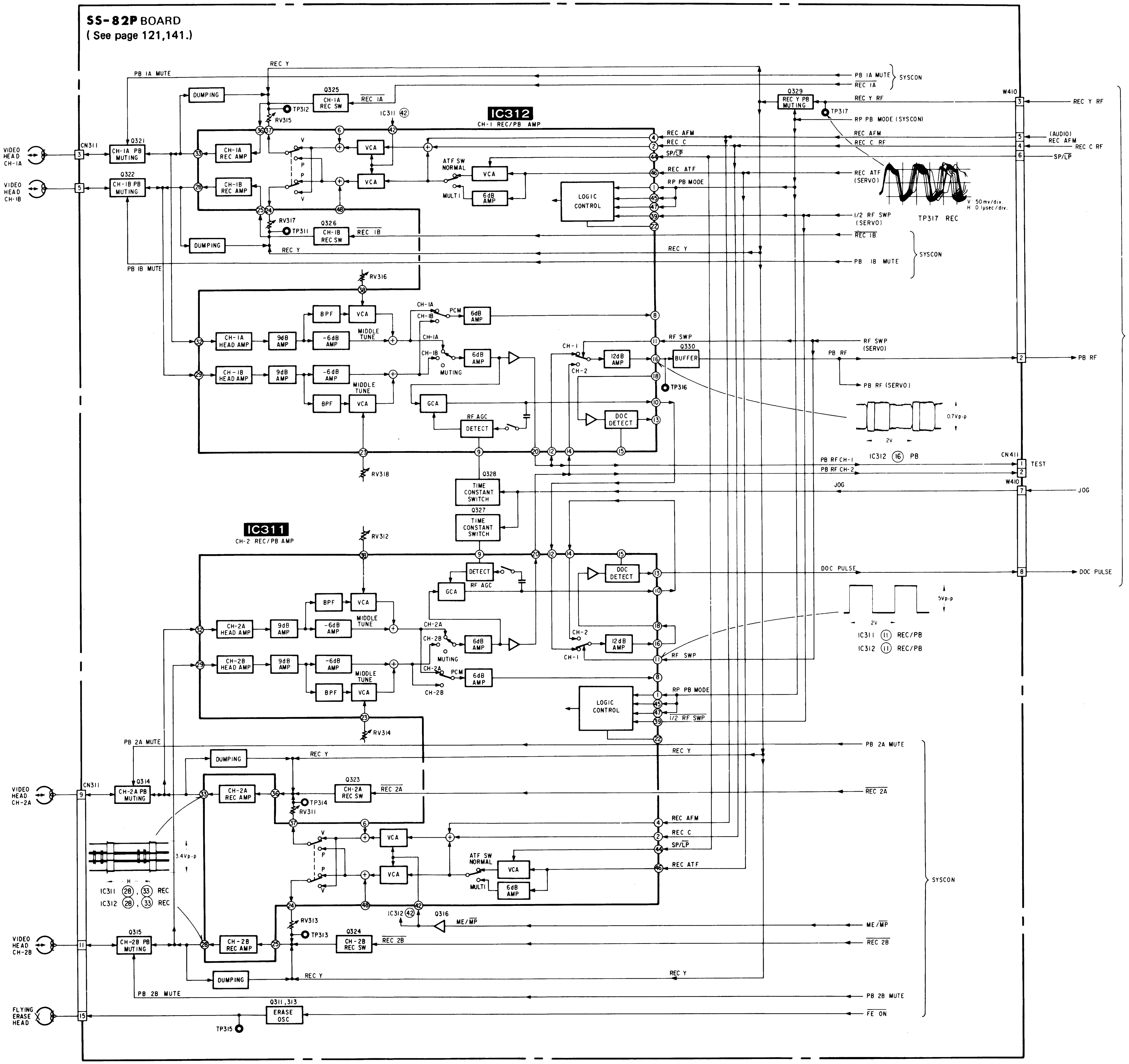

IC941
TITLE MEMORY
256k BIT STATIC MEMORY
CS 20
Q941
OE 22
WE 27
A0 – A5
10 – 5
A6 – A13
4, 3, 25, 24, 21, 23, 2, 26
A14 1
6
8
54 OE
49 WE
20 – 24, 27
28, 29, 51, 52, 55, 53, 30, 50
31 A14
A0 I A5
A6 I A13
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
16 15 14
CG BK
CG IN
CG MK
CHRACTOR MIX
YR, YG, YB SYNTHESIS
TITLE Y READ
Y RO 48
Y CO 47
Y BO 46
Y MATRIX
E DGE SYNTHESIS 45
CR, CG, CB SYNTHESIS
C RO 41
C CO 40
C BO 39
E DGE SYNTHESIS
C BLK 38
TITLE C READ
INVERT
Y/C DELAY
TITLE Y+C READ
V TITLE AREA
SCROLL MODE
A TITLE AREA SCROLL MODE GENERATOR
FRAME DETECT
VD 43
HD 44
H TIMING GENERATOR
PHASE DETECT
MASTER LOCK
OSC O 11
OSC I 9
PD UP 12
XP DN 13
CT941
PLL ADJ
D941
VCO
LPF
TP944
TP941
1.1Vp-p
H
IC942 43
4.8Vp-p
H
IC942 44
W941
16
SRAM CS (SYSCON)
11
10
FC-13P BOARD
SS-82P BOARD
DDS B
DDS W
VIDEO (1)
W942
TY MIX 1 TY MIX
TY BLK 4 TY BLK
TR 8 TR
TG 7 TG
TB 6 TB
TC BLK 5 TC BLK
CAMERA
W941
VD 9 VD
HD 8 HD
Q884
FC-13P BOARD
(See page 159.)
IC801
AF-36P BOARD
(See page 113.)
VD
HD
CAMERA
W941
14 DDS SCK
13 DDS SO
15 TITLE CS
12 DDS SI
SYSCON

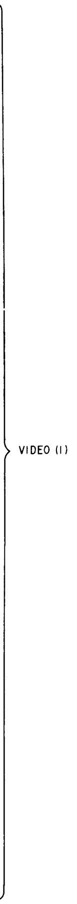
3-6. VIDEO (1) BLOCK DIAGRAM


VA-39BOARD
(See page 128, 147.)
IC003 (1/4)
IC003 (1/4)
IC003 (1/4)
IC002
IC005
IC007
LPF
SHARPNESS
EQ
REC
PB
V REG
Q070
EDIT (W003 35)
BUFFER
Q054
EMPHASIS
RV014 EMP LEVEL
Q047
Q045
BUFFER
Q046,Q056 REC/PB SWITCH
VA PB MODE (IC008 3)
IC003 30, 31 PB
IC003 53 PB
IC003 20 REC/PB
LINE Y/ PB Y
AGC AMP
TRAP
ATT
LIM
4.43MHz TRAP
4.43MHz BPF
HPF
CHROMA CANCEL
EQ
LPF 1
LPF 2
LPF 3
DOC LPF
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
YD DELAY
CROSS TALK CANCEL
2H+YD DELAY
CLAMP
FSC (Q039)
IC003 35 PB
IC003 47 PB
IC003 45 PB
REC LINE Y+C
PB Y
PB C
4.43MHz BPF
IC002 30 PB
REC/PB C
SYNC
SYNC SEP
HALF H KILLER
HD
NOR
DOC
CLAMP
AGC AMP
AGC DET
REC Y+C
REC/PB
IC003 39 PB
IC002 19 PB
RV003 IR2
LINE REC+PB (Q009)
Q044 IR2 SWITCH
IR2
REC CAMY
REC LINE Y/PB Y
Q048 BUFFER
LINE +PB (Q074)
IC005 1 REC
JOG
JOG (IC006 6)
DOC PULSE
REC Y RF
PB RF
REC C RF
VIDEO (2)
W003
POWER SUPPLY FOR IC002 (LINE REC+PB 5V)
Q009
VIDEO 5V
Q008
Q071
POWER SAVE (IC008 4)
CAM/LINE (IC008 7)
VA PB MODE (IC008 3)
Q007
Q072
POWER SUPPLY FOR IC003
POWER SAVE (IC008 4)
TP009
Q034,035 REC EQ
RV010 REC Y
Q036 BUFFER
CHROMA/ AFM BAND REJECTION
Q033
REC/EE 5V
IC003 59 REC
IC003 25 REC
LIMITER
FM MOD
V/I CONV
RV009 CARR SET
RV008 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
CLAMP
REC/PB Y
PB RF (AUDIO)
L014 C075
L015,C076 L016,C077
AFM/ATF TRAP
Q026 BUFFER
TP008
L017,C079 CHROMA TRAP
Q027,Q002 SOFT LIMITER
Q028 LPF
Q030 FREQUENCY CHARACTERISTIC SELECT
JOG (IC008 6)
DOC PULSE (W003 8)
Q031
Q032 DELAY
Q065 LPF
PB C RF
Q023,024
PB 5V
VA PB MODE (IC008 3)
POWER SAVE (IC008 4)
LIMITER
BPF
LIMITER
FM DEMOD
LPF
EQ
RV004 DEEP LEVEL
Q049 EQ
Q050,064 HALF H SHIFT CANCEL
RF SWP (W003 9)
Q086 SP/LP SWITCH
SP/LP (IC008 14)
Q042 BUFFER
CLIP
MAIN DE-EMPHASIS
HPF
HPF
NOISE CANCEL
HPL
HPF
ATT
Y/C MIX
PB Y+C
RV007 PB V LEVEL
Q043 PB VIDEO BUFFER
IC003 60 PB
IC003 22, 23 PB
IC003 57 PB
IC003 56 PB
IC003 13, 16 REC/PB
IC003 1 REC/PB
IC003 5 REC
4.43MHz
5.17MHz
PB CHROMA
RV012 GAIN
Q063 JOG SWITCH
AMP
TH/DL
SEQUENCE DET
PHASE SHIFT
RV005 FSC
-90° SHIFT
X2
2FSC
QUASI BURST
1/2FH MP
1/2FH
SWD1/2FH
1/2
FH VCO
D004
MODE
IC007 4 PB
TP004
Q066 CHROMA ATT
CNR
FL001 5.17MHz CF
X001 4.43MHz
Q039 FSC BUFFER
Q085
Q041 REC C BUFFER
REC C EQ & AFM TRAP
REC/EE 5V (Q033)

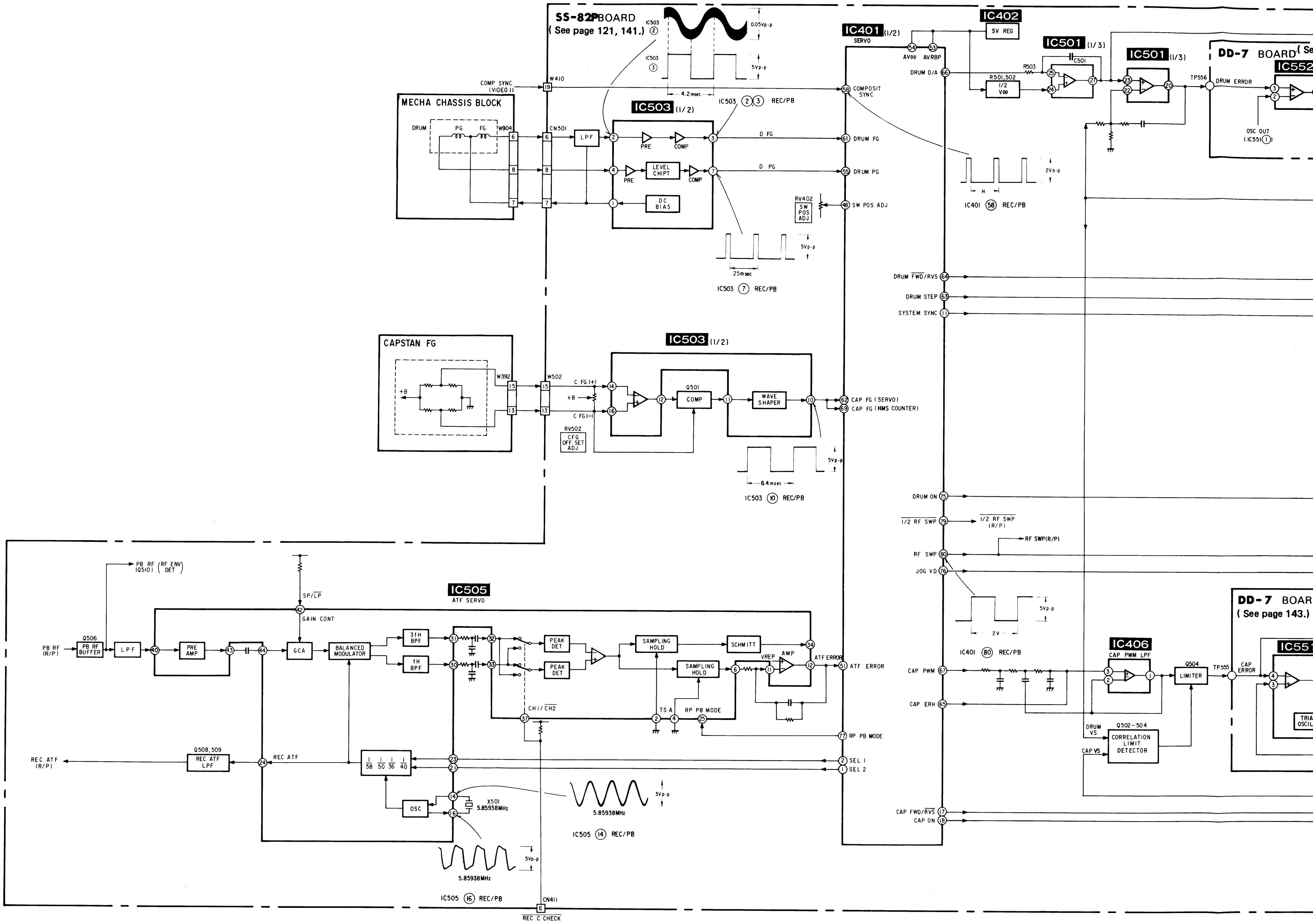

IC007
JOG CHROMA PROCESS
RV012
GAIN
Q063
JOG SWITCH
JOG (IC008 ⑥)
AMP
TH/DL
FREQUENCY CONVERTER
SEQUENCE DET
PHASE SHIFT
-90° SHIFT
X2
LPF
APC DET
QUASI BURST
FH VCO
AFC ID
MASK
HALF H KILLER
1/2
BF GENERATOR
MODE
PB
JOG
TH CHROMA
DL CHROMA
SWD1 1/2FH
BFXCH TH/DL
RV006
LPF ADJ
Q038
SYNC (IC003 ⑳)
DOC (W003 ⑧)
HD
IC007 ⑮ PB
REC CAMY
Q081,082
DELAY
REC LINE Y+C
Q080
BUFFER
IC001
IC001 ④,⑪,㉘ REC ㉘ PB
IC001 ②,④,⑧ PB
CLAMP
SYNC SEP
3dB AMP
AGC AMP
AGC DET
CHARACTER MIX
6dB AMP
VD INSERT
1.2V REG
RV001
REC AGC
Q058
AGC DISCHARGE
V MUTE (IC008 ⑪)
BUS DECODER
CAM C Q011
CHROMA AMP
Q013,014
CHROMA MUTING
Q012
BUFFER
LINE+PB (Q074)
V MUTE (IC008 ⑪)
Q006
BUFFER
LPF
Q075,076
CAM Y AMP
Q010
EVF CHARACTER MIX
CHROMA TRAP
VOW3
CN002
CAM Y (CAMERA)
CN001
CN004
EVF OUT (VIEW FINDER)
J001
VIDEO OUT
W003
VIDEO CS
COSMO SCK
COSMO SO
SYSCON
IC001 ⑧ REC
IC001 ⑭ REC
Q004
SYNC DET
Q052
V or H SYNC SEP
Q051 Q040
V/H SYNC SEP SELECT
Q005
SYNC BUFFER
CG DOP (W003 ⑪)
VA PB MODE (IC008 ⑬)
VIDEO 5V
SS 5V
Q068
Q059 Q062
HD (IC007 ⑩)
DOC PULSE (W003 ⑧)
JOG (IC008 ⑥)
V MUTE (IC008 ⑪)
D011
Q060
Q073
COMP SYNC (SERVO)
SYSCON/SERVO
EDIT (SYSCON)
RF SWP (SERVO)
CG DOP (SYSCON)
Q066
CHROMA ATT
TP004
CNR
RV013
COMB ADJ
FL006
2H DELAY
Q018,019
AMP
Q015—017
LIMITER
Q021,022
AMP
Q020
BUFFER
FL005
4.43MHz BPF
PB 5V (Q023)
IC007 ⑩,⑪ PB
IC009
PDUP
XPDN
V CON
XVCO
CT001
D003
AFC
JOG VD
SYNC GEN
VCO
PHASE COMP
C SYNC
S DET
MUTE
V MUTE (IC008 ⑪)
VD
HD
MASK
VOB1
VOW1
STUP
VOB2
VOW2
VOW3
DS ON
DATA SCREEN (IC008 ⑤)
JOG VD (SERVO)
IC008
CHARACTER GENERATOR
STB
CLK
DATA
V BLK VG
OSCO OSCI
CT002
CHARA POSI
CG BUSY
Q061
CG STB
DDS SCK
DDS SO
CG BUSY
DDS W
DDS B
DIGITAL TITLE
IC003 (1/4)
FH/2 IN
FL001
5.17MHz CF
X001
4.43MHz
FREQ CONV
732KHz
1/375
1/8
375fH VCO
APC ID DET
AFC ID
AFC DET
VCO OUT
APC ADJ
4.43MHz VXO/XO
APC DET
Q039
FSC BUFFER
Q043
PB VIDEO BUFFER
BUS DECODER
Q067
RF SWP (W003 ⑨)
BID FF
PHASE INVERT
ACK DET
BURST ID DET
SYNC DET
PB FREQ CONV
FL003
PB C TRAP
ACC DET
LPF
ACC AMP
PB C (4.43MHz)
REC/PB C
REC/PB C (4.43MHz)
LINE REC C
Q085
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS (REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
Q041
REC C BUFFER
REC C EQ & AFM TRAP
REC FREQ CONV
PB/CAM REC C
C EMPHASIS TRAP
TRAP FREQ SW
Q037
VA PB MODE (IC008 ⑬)
REC/EE 5V (Q033)
IC003 ⑤ REC
IC003 ④ PB
IC003 ⑨,⑩ PB
IC003 ⑭ REC/PB
IC004
LINE+PB (Q074)
CAM C (4.43MHz)
PB C (732KHz)
IC004 ① REC
Q077,078
CAM C AMP
CAM C (CAMERA)
IC008
POWER SAVE
DATA SCREEN
JOG
CAM/LINE
V MUTE
A MUTE
VA PB MODE
SP/LP
Q074
LINE+PB
DATA SERIAL TO PARALLEL CONVERTER
A STB
SO
SCK
OE
AUDIO STB
SYSTEM RESET
SP/LP

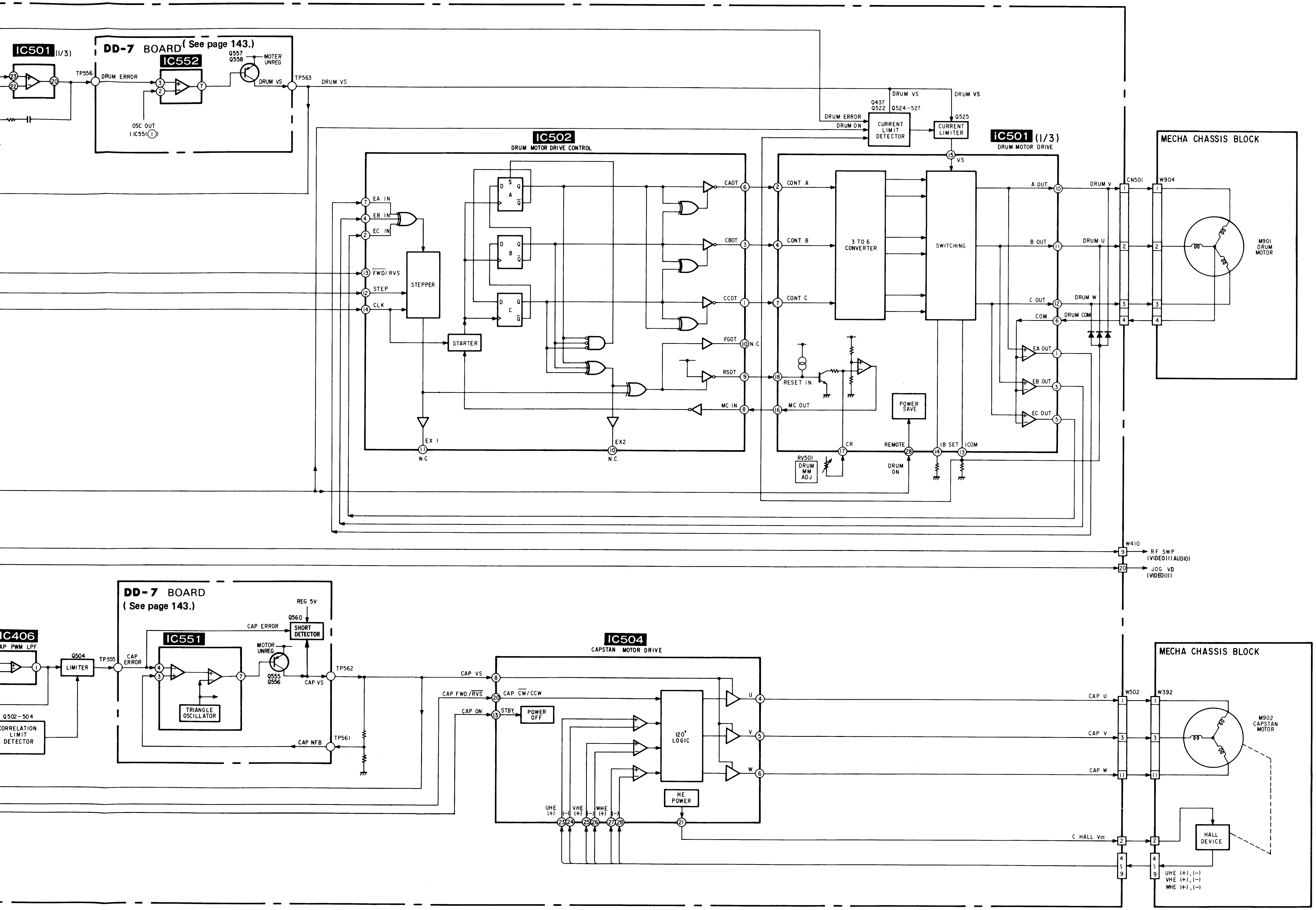
3-7. VIDEO (2) BLOCK DIAGRAM


SS-82P BOARD
(See page 121,141.)
IC312
CH-1 REC/PB AMP
IC311
CH-2 REC/PB AMP
VIDEO HEAD CH-1A
VIDEO HEAD CH-1B
VIDEO HEAD CH-2A
VIDEO HEAD CH-2B
FLYING ERASE HEAD
CN311
Q321 CH-1A PB MUTING
Q322 CH-1B PB MUTING
Q314 CH-2A PB MUTING
Q315 CH-2B PB MUTING
DUMPING
CH-1A REC AMP
CH-1B REC AMP
CH-2A REC AMP
CH-2B REC AMP
Q325 CH-1A REC SW
Q326 CH-1B REC SW
Q323 CH-2A REC SW
Q324 CH-2B REC SW
TP311
TP312
TP313
TP314
TP315
TP316
TP317
RV311
RV312
RV313
RV314
RV315
RV316
RV317
RV318
IC311 42
IC312 42
VCA
ATF SW NORMAL
MULTI
6dB AMP
LOGIC CONTROL
CH-1A HEAD AMP
CH-1B HEAD AMP
CH-2A HEAD AMP
CH-2B HEAD AMP
9dB AMP
-6dB AMP
BPF
MIDDLE TUNE
PCM
MUTING
GCA
RF AGC
DETECT
12dB AMP
DOC DETECT
Q330 BUFFER
CH-1
CH-2
Q328 TIME CONSTANT SWITCH
Q327 TIME CONSTANT SWITCH
Q329 REC Y PB MUTING
Q316
ME/MP
Q311,313 ERASE OSC
PB 1A MUTE
PB 1B MUTE
PB 2A MUTE
PB 2B MUTE
REC Y
REC 1A
REC 1B
REC 2A
REC 2B
REC AFM
REC C
SP/LP
REC ATF
RP PB MODE
1/2 RF SWP
RF SWP
REC Y RF
RP PB MODE (SYSCON)
REC C RF
REC ATF (SERVO)
1/2 RF SWP (SERVO)
RF SWP (SERVO)
PB RF
PB RF (SERVO)
PB RF CH-1
PB RF CH-2
JOG
DOC PULSE
FE ON
SYSCON
VIDEO (1)
(AUDIO) REC AFM
W410
CN411
TEST
V: 50mv/div.
H: 0.1μsec/div.
TP317 REC
0.7Vp-p
2V
IC312 16 PB
5Vp-p
IC311 11 REC/PB
IC312 11 REC/PB
3.4Vp-p
H
IC311 28, 33 REC
IC312 28, 33 REC

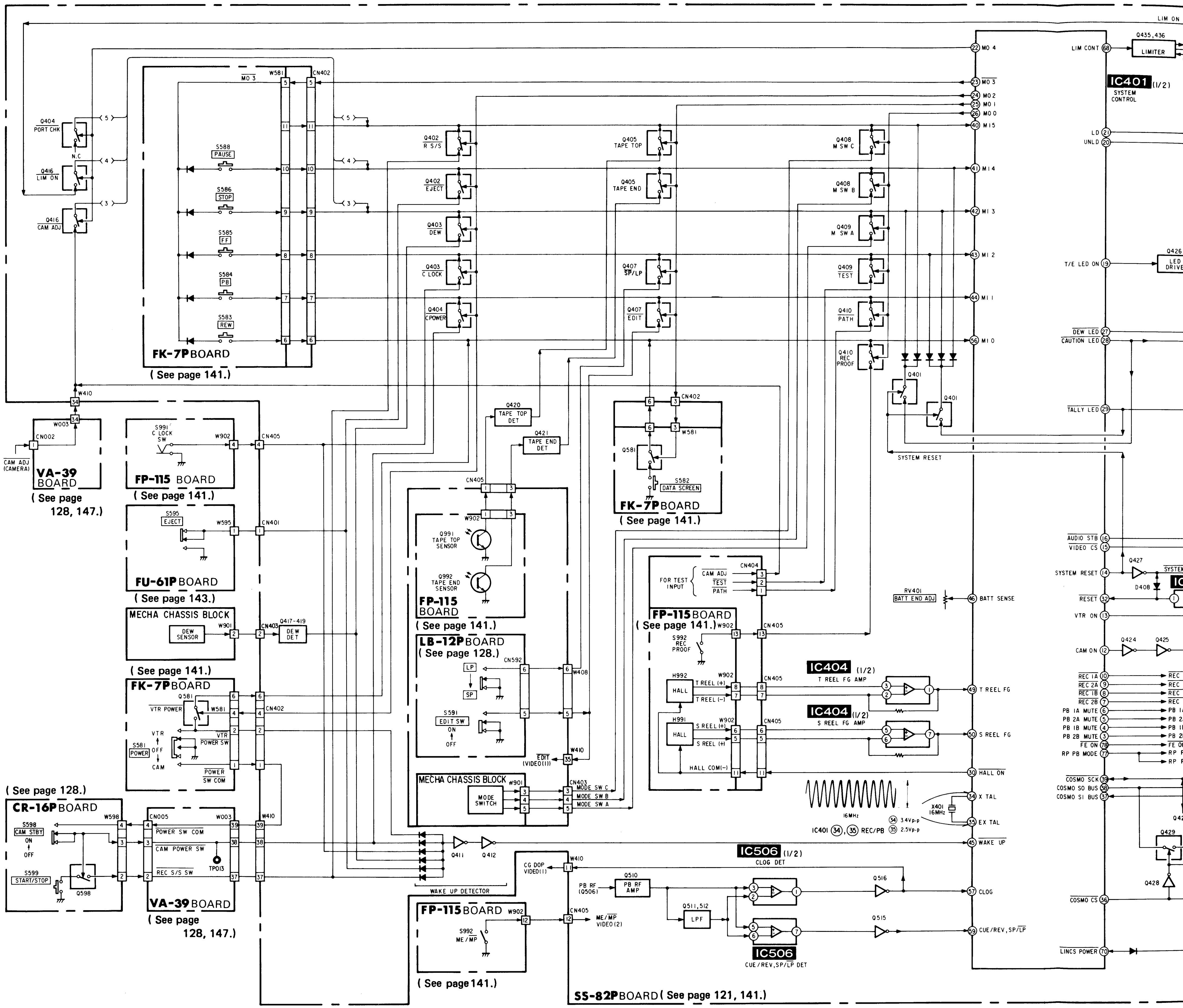

VIDEO (1)

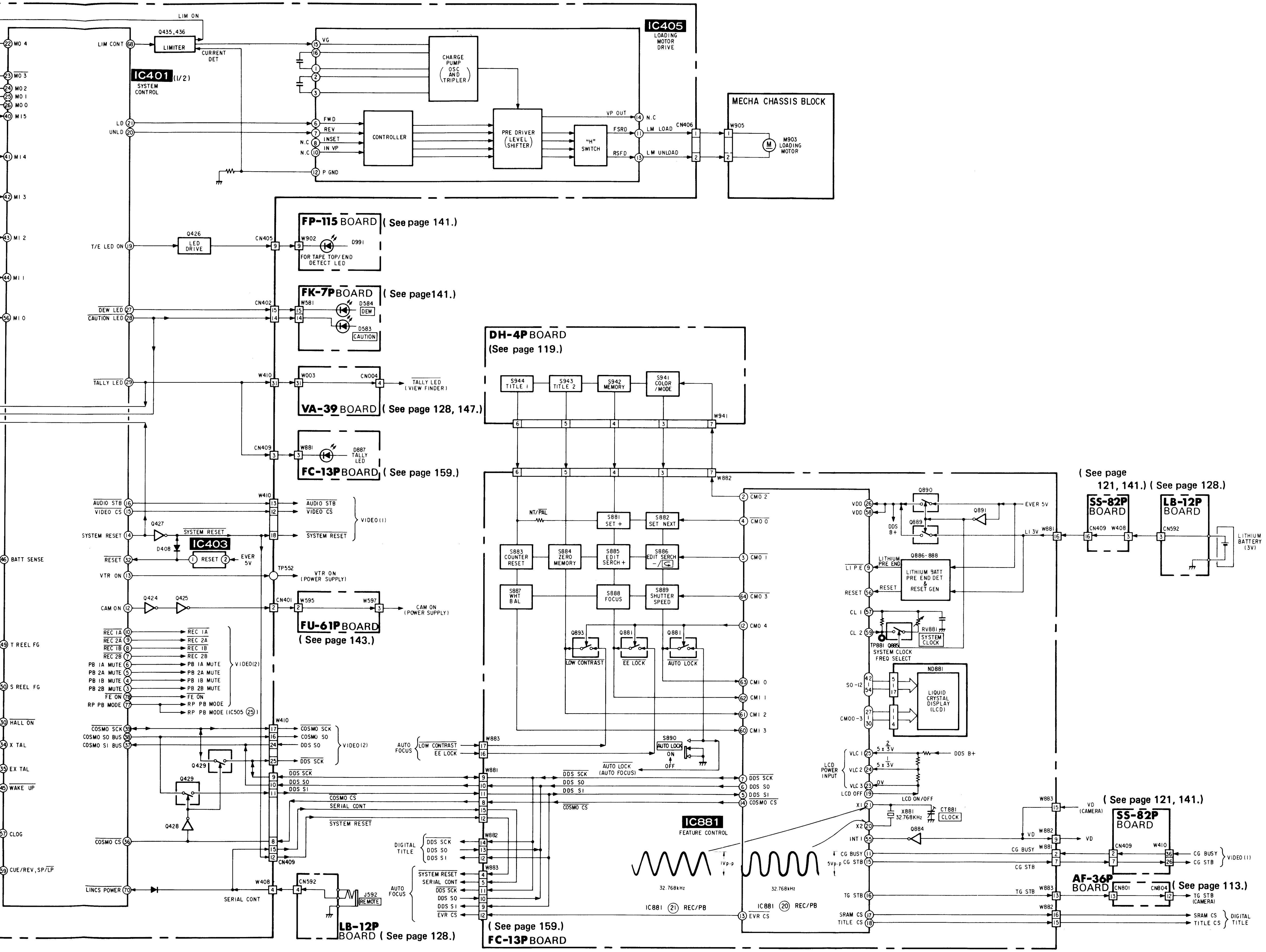
3-8. SERVO BLOCK DIAGRAM


SS-82P BOARD
(See page 121, 141.)
IC503 ②
0.05Vp-p
IC503 ③
5Vp-p
4.2msec
IC503 ②③ REC/PB
COMP SYNC (VIDEO I)
W410
19
MECHA CHASSIS BLOCK
DRUM
PG
FG
W904
CN501
LPF
IC503 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
D FG
D PG
5Vp-p
25msec
IC503 ⑦ REC/PB
IC401 (1/2)
SERVO
AVDD
AVRBP
DRUM D/A
COMPOSIT SYNC
DRUM FG
DRUM PG
RV402
SW POS ADJ
SW POS ADJ
IC402
SV REG
IC501 (1/3)
R503
C501
R501,502
1/2 VDD
IC501 (1/3)
TP556
DD-7 BOARD
DRUM ERROR
IC552
OSC OUT (IC551①)
2Vp-p
H
IC401 (58) REC/PB
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
CAPSTAN FG
+B
W392
W502
C FG (+)
C FG (-)
IC503 (1/2)
Q501
COMP
WAVE SHAPER
RV502
CFG OFF SET ADJ
CAP FG (SERVO)
CAP FG (HMS COUNTER)
5Vp-p
8.4msec
IC503 ⑩ REC/PB
DRUM ON
1/2 RF SWP
1/2 RF SWP (R/P)
RF SWP(R/P)
RF SWP
JOG VD
5Vp-p
2V
IC401 (80) REC/PB
PB RF (RF ENV) (Q510) (DET)
SP/LP
IC505
ATF SERVO
GAIN CONT
PB RF (R/P)
Q506
PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
PEAK DET
PEAK DET
SAMPLING HOLD
SAMPLING HOLD
SCHMITT
VREP
AMP
ATF ERROR
ATF ERROR
CH1/CH2
TS A
RP PB MODE
RP PB MODE
REC ATF (R/P)
Q508,509
REC ATF LPF
REC ATF
58 50 36 40
SEL 1
SEL 2
OSC
X501
5.85938MHz
3Vp-p
5.85938MHz
IC505 ⑭ REC/PB
5Vp-p
5.85938MHz
IC505 ⑯ REC/PB
CN411
REC C CHECK
CAP PWM
CAP ERR
IC406
CAP PWM LPF
Q504
LIMITER
TP555
CAP ERROR
DD-7 BOARD
(See page 143.)
IC551
TRIA OSCIL
DRUM VS
CAP VS
Q502-504
CORRELATION LIMIT DETECTOR
CAP FWD/RVS
CAP ON


IC501 (1/3)
DD-7 BOARD (See page 143.)
IC552
Q557 Q558
MOTER UNREG
TP556
DRUM ERROR
DRUM VS
TP563
OSC OUT (IC551①)
DRUM ERROR
DRUM ON
Q437 Q522
CURRENT LIMIT DETECTOR
Q524-527
Q525
CURRENT LIMITER
IC502
DRUM MOTOR DRIVE CONTROL
EA IN
EB IN
EC IN
FWD/RVS
STEP
CLK
STEPPER
STARTER
CAOT
CBOT
CCOT
FGOT
RSOT
MC IN
N.C
EX 1
EX2
IC501 (1/3)
DRUM MOTOR DRIVE
VS
CONT A
CONT B
CONT C
3 TO 6 CONVERTER
SWITCHING
A OUT
B OUT
C OUT
COM
EA OUT
EB OUT
EC OUT
RESET IN
MC OUT
POWER SAVE
CR
REMOTE
IB SET
ICOM
RV501 DRUM MM ADJ
DRUM ON
DRUM V
DRUM U
DRUM W
DRUM COM
CN501
W904
MECHA CHASSIS BLOCK
M901 DRUM MOTOR
W410
RF SWP (VIDEO(1) AUDIO)
JOG VD (VIDEO(1))
DD-7 BOARD (See page 143.)
IC406
CAP PWM LPF
Q504
LIMITER
Q502-504
CORRELATION LIMIT DETECTOR
TP555
CAP ERROR
IC551
TRIANGLE OSCILLATOR
MOTOR UNREG
Q555 Q556
REG 5V
Q560
SHORT DETECTOR
CAP VS
TP562
TP561
CAP NFB
IC504
CAPSTAN MOTOR DRIVE
CAP VS
CAP FWD/RVS
CAP CW/CCW
CAP ON
STBY
POWER OFF
120° LOGIC
HE POWER
UHE (+) (−)
VHE (+) (−)
WHE (+) (−)
U
V
W
CAP U
CAP V
CAP W
C HALL Vcc
W502
W392
MECHA CHASSIS BLOCK
M902 CAPSTAN MOTOR
HALL DEVICE
UHE (+), (−)
VHE (+), (−)
WHE (+), (−)

3-9. SYSTEM CONTROL BLOCK DIAGRAM


LIM ON
MO 4
MO 3
MO 2
MO 1
MO 0
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
LIM CONT
Q435,436
LIMITER
IC401 (1/2)
SYSTEM CONTROL
LD
UNLD
T/E LED ON
Q426
LED DRIVE
DEW LED
CAUTION LED
TALLY LED
SYSTEM RESET
Q404 PORT CHK
N.C
Q416 LIM ON
Q416 CAM ADJ
W581
CN402
S588 PAUSE
S586 STOP
S585 FF
S584 PB
S583 REW
FK-7P BOARD
(See page 141.)
Q402 R S/S
Q402 EJECT
Q403 DEW
Q403 C LOCK
Q404 C POWER
Q405 TAPE TOP
Q405 TAPE END
Q407 SP/LP
Q407 EDIT
Q408 M SW C
Q408 M SW B
Q409 M SW A
Q409 TEST
Q410 PATH
Q410 REC PROOF
Q401
W410
W003
CN002
CAM ADJ (CAMERA)
VA-39 BOARD
(See page 128, 147.)
S991 C LOCK SW
W902
CN405
FP-115 BOARD
(See page 141.)
S595 EJECT
W595
CN401
FU-61P BOARD
(See page 143.)
MECHA CHASSIS BLOCK
W901
DEW SENSOR
CN403
Q417-419
DEW DET
(See page 141.)
FK-7P BOARD
Q581
VTR POWER
W581
VTR
S581 POWER
OFF
CAM
VTR POWER SW
POWER SW COM
(See page 128.)
CR-16P BOARD
W598
S598 CAM STBY
ON
OFF
S599 START/STOP
Q598
CN005
W003
POWER SW COM
CAM POWER SW
TP013
REC S/S SW
VA-39 BOARD
(See page 128, 147.)
Q420 TAPE TOP DET
Q421 TAPE END DET
Q991 TAPE TOP SENSOR
Q992 TAPE END SENSOR
FP-115 BOARD
(See page 141.)
LB-12P BOARD
(See page 128.)
CN592
LP
SP
S591 EDIT SW
ON
OFF
W408
EDIT (VIDEO(1))
MECHA CHASSIS BLOCK
MODE SWITCH
MODE SW C
MODE SW B
MODE SW A
Q411
Q412
WAKE UP DETECTOR
CG DOP VIDEO(1)
FP-115 BOARD
S992 ME/MP
(See page 141.)
S582 DATA SCREEN
FK-7P BOARD
(See page 141.)
CN404
FOR TEST INPUT
CAM ADJ
TEST
PATH
FP-115 BOARD
(See page 141.)
S992 REC PROOF
H992
HALL
T REEL (+)
T REEL (−)
H991
S REEL (+)
S REEL (−)
HALL COM(−)
IC404 (1/2)
T REEL FG AMP
IC404 (1/2)
S REEL FG AMP
RV401 BATT END ADJ
BATT SENSE
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
16MHz
X401 16MHz
IC401 ㉞, ㉟ REC/PB
㉞ 3.4Vp-p
㉟ 2.5Vp-p
IC506 (1/2)
CLOG DET
PB RF (Q506)
Q510 PB RF AMP
Q511,512 LPF
ME/MP VIDEO(2)
Q516
Q515
IC506
CUE/REV,SP/LP DET
CLOG
CUE/REV,SP/LP
SS-82P BOARD (See page 121, 141.)
AUDIO STB
VIDEO CS
Q427
SYSTEM RESET
D408
RESET
VTR ON
CAM ON
Q424
Q425
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
COSMO SCK
COSMO SO BUS
COSMO SI BUS
Q429
Q428
COSMO CS
LINCS POWER


LIM ON
Q435,436
LIMITER
CURRENT DET
LIM CONT
IC401 (1/2)
SYSTEM CONTROL
MO 4
MO 3
MO 2
MO 1
MO 0
M 15
M 14
M 13
M 12
M 11
M 10
LD
UNLD
IC405
LOADING MOTOR DRIVE
VG
CHARGE PUMP (OSC AND TRIPLER)
FWD
REV
INSET
IN VP
N.C
P GND
CONTROLLER
PRE DRIVER (LEVEL SHIFTER)
"H" SWITCH
VP OUT
FSRD
RSFD
LM LOAD
LM UNLOAD
CN406
MECHA CHASSIS BLOCK
W905
M903 LOADING MOTOR
Q426
LED DRIVE
T/E LED ON
CN405
FP-115 BOARD (See page 141.)
W902
D991
FOR TAPE TOP/END DETECT LED
DEW LED
CAUTION LED
CN402
FK-7P BOARD (See page141.)
W581
D584 DEW
D583 CAUTION
TALLY LED
W410
W003
CN004
TALLY LED (VIEW FINDER)
VA-39 BOARD (See page 128, 147.)
CN409
W881
D887 TALLY LED
FC-13P BOARD (See page 159.)
DH-4P BOARD (See page 119.)
S944 TITLE 1
S943 TITLE 2
S942 MEMORY
S941 COLOR / MODE
W941
W882
AUDIO STB
VIDEO CS
SYSTEM RESET
VIDEO (1)
Q427
D408
IC403
RESET
EVER 5V
BATT SENSE
VTR ON
TP552
VTR ON (POWER SUPPLY)
Q424
Q425
CAM ON
CN401
W595
W597
CAM ON (POWER SUPPLY)
FU-61P BOARD (See page 143.)
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
RP PB MODE (IC505 ㉙)
VIDEO (2)
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV, SP/LP
COSMO SCK
COSMO SO BUS
COSMO SI BUS
COSMO SO
DDS SO
DDS SCK
DDS SI
Q429
Q428
COSMO CS
SERIAL CONT
LINCS POWER
W408
CN592
J592 REMOTE
SERIAL CONT
LB-12P BOARD (See page 128.)
NT/PAL
S881 SET +
S882 SET NEXT
S883 COUNTER RESET
S884 ZERO MEMORY
S885 EDIT SERCH +
S886 EDIT SERCH -/
S887 WHT BAL
S888 FOCUS
S889 SHUTTER SPEED
Q893
Q881
LOW CONTRAST
EE LOCK
AUTO LOCK
S890 AUTO LOCK ON OFF
AUTO FOCUS
AUTO LOCK (AUTO FOCUS)
W883
DIGITAL TITLE
SYSTEM RESET
EVR CS
(See page 159.)
FC-13P BOARD
CMO 2
CMO 0
CMO 1
CMO 3
CMO 4
CMI 0
CMI 1
CMI 2
CMI 3
IC881
FEATURE CONTROL
1Vp-p
5Vp-p
32.768kHz
IC881 ㉑ REC/PB
IC881 ⑳ REC/PB
VDD
Q890
Q891
Q889
DDS B+
EVER 5V
LI 3V
LITHIUM PRE END
Q886-888
LITHIUM BATT PRE END DET & RESET GEN
LI P.E
RESET
CL 1
CL 2
RV881 SYSTEM CLOCK
TP881
Q885
SYSTEM CLOCK FREQ SELECT
ND881
LIQUID CRYSTAL DISPLAY (LCD)
SO-12
CMOO-3
LCD POWER INPUT
VLC 1
VLC 2
VLC 3
2/3 V
1/3 V
0V
LCD OFF
LCD ON/OFF
X1
X2
X881 32.768kHz
CT881 CLOCK
Q884
INT 1
CG BUSY
CG STB
TG STB
SRAM CS
TITLE CS
VD (CAMERA)
VD
(See page 121, 141.) (See page 128.)
SS-82P BOARD
LB-12P BOARD
CN409
W408
CN592
LITHIUM BATTERY (3V)
(See page 121, 141.)
SS-82P BOARD
W410
VIDEO (1)
AF-36P BOARD
CN801
CN804
(See page 113.)
TG STB (CAMERA)
DIGITAL TITLE

3-10. EXPLANATION OF FUNCTION OF SYSTEM CONTROL MICROCOMPUTER

The system control assembly is composed of the following four microcomputer.

- Mode/Mechanism control microcomputer CXP80116
- DDS microcomputer μpD7503GF
- EVR microcomputer MC68HC05N2FU
- AF microcomputer MC68HC05C4FU

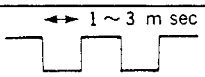
3-10-1. MODE/MECHANISM CONTROL MICROCOMPUTER CXP80116 (SS-82P BOARD IC401)

1. Explanation of Function
    1) Control of POWER ON/OFF
    2) key-matrix read
       (PB, FF, REW, PAUSE, DATA-SCREEN, POWER SW, STOP)
    3) Servo
    4) Loading motor control
    5) Detection of abnormalities
        - Battery end/pre-end
        - Tape end/pre-end
        - No cassette
        - REC PROOF
        - DEW
        - PAUSE release
        - CLOG
        - L. MOTOR EMERGENCY
        - Drum rotation
        - Drum phase
        - Reel rotation
        - Capstan rotation
        - Drum/Capstan activation
    6) H. M. S counter
    7) JOG VD insert
    8) Execution of each mode

2. Outline specification
    - 8 bit highspeed, highintegrated 1 chip microcomputer
    - A/D converter 8 bit 8 channel
    - Serial interface
    - Timer/Counter
    - Time base timer
    - Vector interrupt
    - High resolution timingpattern generation function (Highspeed output).
    - PWM/DA gate pulse output 12 bit 2 channel
    - High resolution measuring function of servo system signal (FRC)
    - Power on reset function
    - Sleep. stop function
    - External memory extension mode, microprocessor mode
    - ROM 16k bytes
    - RAM 352 bytes
    - Speed 500ns
    - Process C MOS
    - Operation voltage 4.5~5.5V (this model 4.3~5.5V)
    - Package 80pin flat package

3. Explantion of Terminal's Function (CXP80116)

<table>
<tr><th>PIN No.</th><th>Signal</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">Controls the frequency of ATF REF PILOT Signal. (＊1)<table><tr><td>ATF REF PILOT</td><td>f_1</td><td>f_2</td><td>f_3</td><td>f_4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF IC CXA1204Q</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3
4
5
6</td><td>PB 2B MUTE
PB 1B MUTE
PB 2A MUTE
PB 1A MUTE</td><td>O</td><td colspan="2">Control signals for crosstalk prevention from other heads during playback
Mute with "H"
(＊1)</td><td>To RP BLOCK</td></tr>
<tr><td>7
8
9
10</td><td>$\overline{\text{REC 2B}}$
$\overline{\text{REC 1B}}$
$\overline{\text{REC 2A}}$
$\overline{\text{REC 1A}}$</td><td>O</td><td colspan="2">Timing signals for change over of drumheads (1A, 2A, 1B, 2B) records.
REC with "L"
(＊1)</td><td>To RP BLOCK</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum-servo Used as clock at the time of STEP by drum-driver IC CXA1206 (＊1)</td><td>Drum servo IC (IC502⑭)</td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">CAM DC/DC converter ON/OFF signal</td><td>To CAMERA DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter ON/OFF signal</td><td>VTR DC/DC converter (TP552)</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Resets AF microcomputer during POWER ON and inputs to serie-parallel IC for MUTE during POWER ON.</td><td>IC801⑨
IC802(60), IC006⑮</td></tr>
<tr><td>15</td><td>$\overline{\text{VIDEO CS}}$</td><td>O</td><td colspan="2">Selection signal of Video IC, CXA1200Q, CXA1201Q for internal bus communication
Selected with "L"</td><td>IC001㉑
IC003⑰</td></tr>
<tr><td>16</td><td>$\overline{\text{AUDIO STB}}$</td><td>O</td><td colspan="2">Serial-parallel IC for internal bus communication Video/Audio. Latches with MC14094BF data strobe signal _↑‾.</td><td>IC006①</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td colspan="2">Control signal for capstan rotation drirection
FWD with "H" RVS with "L" (＊1)</td><td>IC504⑳</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Control signal for capstan driver (＊1)</td><td>IC504⑬</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">Signal driving Tape TOP/END LED</td><td>Q426 Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Control signal for loading motor<table><tr><td>status / signal</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td rowspan="2">To loading motor driver
IC405⑥, ⑦</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Matrix outputs only $\overline{\text{MO3}}$ is LOW ACTIVE</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\text{MO3}}$</td><td>O</td></tr>
<tr><td>24</td><td>MO2</td><td>O</td></tr>
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\text{DEW LED}}$</td><td>O</td><td>Driving DEW warning LED</td><td rowspan="3">medium pressure proof
(12V)
Large current
(12mA)
port</td><td>DEW LED
D584</td></tr>
<tr><td>28</td><td>$\overline{\text{CAUTION LED}}$</td><td>O</td><td>Driving CAUTION warning LED</td><td>CAUTION LED
D583</td></tr>
<tr><td>29</td><td>$\overline{\text{TALLY LED}}$</td><td>O</td><td>External TALLY LED
EVF internal TALLY LED } Driving</td><td>TALLY LED
D887, 951</td></tr>
</table>

PIN No.	Signal	I/O	Function	Connection
30	HALL ON	O	Reel FG hall device driving, medium pressure proof, large current port 	Reel sensor
31	MP	I	Selection terminal of micro processor mode → no selection	GND
32	RESET	I	Reset input "L" active	Reset IC IC403
33	Vss		GND	GND
34	XTAL	O	Terminal connecting system clock oscillation crystal. Oscillating with 16MHz	Oscillating crystal X401
35	EXTAL	I		
36	COSMO CS	I	Selection signal of cosmo V from the internal bus communication DDS microcomputer. Selects with "L"	DDS microcomputer IC881
37	COSMO SI BUS	I	Serial data input terminal	
38	COSMO SO BUS	O	Serial data output terminal	
39	COSMO SCK	I/O	Input-output terminal of serial clock	
40	MI 5	I	Matrix inputs	
41	MI 4			
42	MI 3			
43	MI 2			
44	MI 1			
45	WAKE UP	I	Input of STBY release Release with "L"	
46	BATT SENSE	I	Input of battery end/pre-end voltage. A/D input terminal	BATT END ADJ RV401
47	N.C.			
48	SW POS ADJ	I	Input of switching position adjustment (test mode), A/D input terminal	SW POS ADJ RV402
49	T REEL FG	I	Input of T/S reel FG, A/D input terminal	IC404 ①
50	S REEL FG			IC404 ⑦
51	ATF ERROR	I	Input of ATF error (ATF LOCK error), A/D input terminal	ATF IC IC505⑫
52	AVss		GND terminal of A/D converter	GND
53	AVREF	I	Input terminal of A/D converter standard reference voltage	EVER 5V for regulator IC IC402 ①
54	AVDD		Supply terminal of A/D converter positive electricity source	
55	DRUM PG	I	DRUM PG input, Input terminal for FRC (high resolution timer) capture	Sense amplifier IC503 ⑦
56	MI 0	I	Matrix input	
57	CLOG	I	Input of CLOG detection signal CLOG with "H"	Q516 ©
58	COMPOSITE SYNC	I	Input of composite synchronizing signal (V SYNC separater on board)	VIDEO IC IC001⑭
59	CUE/REV SP/LP	I	Input of discrination signal of SP/LP during CUE/REV, etc	Q515 ©
60	DRUM PG	I	Not used	Sense amplifier IC503 ⑦
61	DRUM FG	I	Input terminal of DRUM FG, input terminal of FRC capture	Sense amplifier IC503 ③

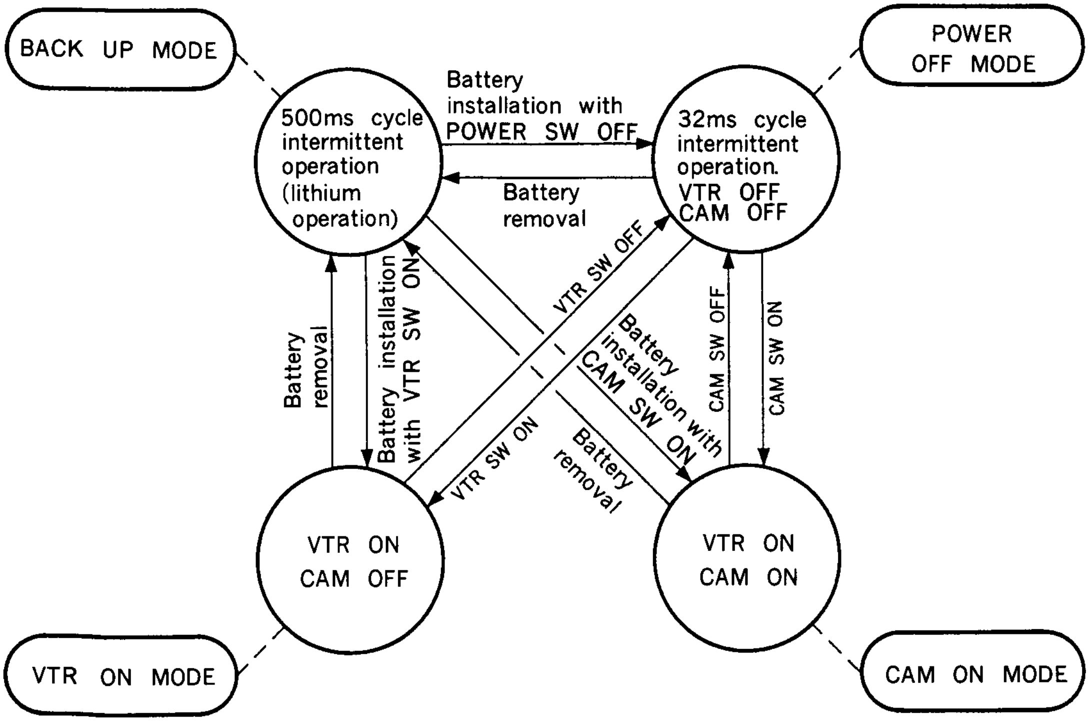
PIN No.	Signal	I/O	Function	connection
62	CAP FG	I	Input terminal of CAPSTAN FG, input terminal of FRC capture	Sense amplifier IC503 ⑩
63	DRUM STEP	O	Control signal of step mode of drum motor driver, "H" at drum activation	IC502⑫
64	DRUM $\overline{\text{FWD}}$/RVS	O	Control signal of DRUM rotation direction RVS with "H" FWD with "L"	IC502⑬
65	CAP ERH	O	H level output terminal to make CAPSTAN ERROR to MAX at CAPSTAN activation and stop	IC406 ③
66	DRUM D/A	O	Output terminal of DA gate pulse for DRUM ERROR output, output terminal dedicated to servo (DA mode)	
67	CAP PWM	O	PWM output terminal for CAP ERROR output, output terminal dedicated to servo (PWM mode)	
68	LIM CONT	O	Control signal for loading motor current limiter for prevention of finger pinching. Limiter ON with "H"	
69	CAP FG	I	CAP FG input terminal for driving TAPE COUNTER External event input terminal for dedicated counter	Sense amplifier IC503 ⑩
70	$\overline{\text{LINCS POWER}}$	I	Input for release of standby of microcomputer to make the equipment power-on from outside using LINCS	Remote jack J592 ②
71	$\overline{\text{NMI}}$	I	Terminal to request non-maskable interrupt.NMI is not used.	EVER 5V
72	V_{DD}		Supply terminal of positive electricity source	EVER 5V
73	V_{SS}		GND terminal	GND
74	V_{PP}		N.C.	EVER 5V
75	DRUM ON	O	Control signal of drum drive ON.	IC501㉘
76	JOG VD	O	Inserted in VIDEO signal at playback with changed speed Output terminal of pseudo-VD (＊1)	IC007⑭
77	RP PB MODE	O	Change over signal of RP amplifier and REC/PB mode of ATF IC (＊1)	ATF IC IC505㉕ RP amplifer
78	$\overline{\text{FE ON}}$	O	Flying erase oscillation ON/OFF signal. Oscillated with "L" (＊1)	FE BLOCK
79	$\overline{\text{1/2 RF SWP}}$	O	1/2 RF SWP output terminal (＊1)	RP amplifer
80	RF SWP	O	RF SWP output terminal (＊1)	RP amplifer Video system

＊1: High resolution real-time-pattern output and high resolution real-time-pulse output terminal.

3-10-2. DDS MICROCOMPUTER μPD7503GF (FC-13P BOARD IC881)

1. Explanation of Functions
   1) Control of internal data communication
   2) Measurement of date/time
   3) LCD display
   4) Key-matrix read
      (AWB, ELECTRONIC-SHUTTER, EDIT+/−, AUTO LOCK, AF MODE, COUNTER RESET, ZERO MEM, TITLE1/2, MEMORY, COLOR/MODE)

2. Operation Mode
   - The mode of the electric source of this equipment is determined by a three position slideswitch of CAM-OFF-VTR. It transits as shown in the figure below.


BACK UP MODE
POWER OFF MODE
500ms cycle intermittent operation (lithium operation)
Battery installation with POWER SW OFF
Battery removal
32ms cycle intermittent operation. VTR OFF CAM OFF
Battery removal
Battery installation with VTR SW ON
VTR SW OFF
Battery installation with CAM SW ON
CAM SW OFF
CAM SW ON
VTR SW ON
Battery removal
VTR ON CAM OFF
VTR ON CAM ON
VTR ON MODE
CAM ON MODE

- The main functions of DDS microcomputer in each mode are shown in the table below.

MODE	POWER	CLOCK MODE	LCD	EVF	MAIN FUNCTIONS
BACK UP	LITHIUM	500ms cycle intermittent oscillation	—	—	Title and tape counter back up. Clock count operation
POWER OFF	EVER5V	32ms cycle intermittent oscillation	○	—	Display on LCD of counter/date/time Setting function of date/time (ZERO MEM, RESET are not available)
VTR ON	EVER5V + SS5V	Continuous Osillation	○	○	Serial communication with EVR, mode/mechanism control microcomputer. Display on EVF, LCD. ZERO MEM, RESET switches are acceptable
CAM ON	EVER5V + SS5V	Continuous Oscillation	○	○	The above+camera features. Display and control of WB, FOCUS, TITLE, ELECTRONIC SHUTTER, etc

3. PIN FUNCTION (μpD7503GF)

PIN No.	SIGNAL	I/O	FUNCTION	INITIAL SETTING			
				Li mode normal	Li mode TEST	EVER 5V mode	SS5V mode
1	—	—					
2	$\overline{\mathrm{CMO\ 2}}$	O	KEY MATRIX drive output 2	H	H		
3	$\overline{\mathrm{CMO\ 1}}$	O	KEY MATRIX drive output 1	H	H		
4	$\overline{\mathrm{CMO\ 0}}$	O	KEY MATRIX drive output 0	H	H		
5	DDS SI	I	Serial communication•Data input	HiZ	HiZ	HiZ	HiZ
6	DDS SO	O	Serial communication•Data output	L	L		
7	$\overline{\mathrm{DDS\ SCK}}$	I/O	Serial communication•Serial clock IN/OUT	L	L		
8	$\overline{\mathrm{TEST}}$	I	TEST mode setting input	HiZ	HiZ	HiZ	HiZ
9	$\overline{\mathrm{LI\ P.E}}$	I	Lithium•pre-end detection input	HiZ	HiZ	HiZ	HiZ
10	VTR PWR	I	SS5V Power detection input	HiZ	HiZ	HiZ	HiZ
11	CG BUSY	I	Character generator BUSY signal input	HiZ	HiZ	HiZ	HiZ
12	CMO 4	O	KEY MATRIX drive output 4.	L	L		
13	$\overline{\mathrm{EVR\ CS}}$	O	EVR Microcomputer communication chip select output	L	L	L	
14	$\overline{\mathrm{COSMO\ CS}}$	O	CXP80116 communication chip select output	L	L	H	
15	CG STB	O	Character generator strobe output	L	L	L	
16	TG STB	O	Timing•Generator strobe output	L	L	L	
17	SRAM CS	O	STATIC RAM Chip select output	L	L	L	
18	TITLE CS	O	Title•Controller•chip select output	L	L	L	
19	LCD OFF	O	LCD display ON/OFF Control output	H	L	L	L
20	X2	O	X'tal oscillation circuit for clock output				
21	X1	I	X'tal oscillation circuit for clock input	HiZ	HiZ	HiZ	HiZ
22	V_{SS}	—	GND terminal				
23	V_{LC3}	—	LCD Power 3 input				
24	V_{LC2}	—	LCD Power 2 input				
25	V_{LC1}	—	LCD Power 1 input				
26	V_{DD}	—	Power input				
27	COM3	O	LCD common terminal for drive output 3				
28	COM2	O	LCD common terminal for drive output 2				
29	COM1	O	LCD common terminal for drive output 1				
30	COM0	O	LCD common terminal for drive output 0				
31 32 ⋮ ⋮ 41	—	O	Not used				
42	S12		LCD segment terminal for drive output 12				
43	S11		LCD segment terminal for drive output 11				
44	S10		LCD segment terminal for drive output 10				
45	S9		LCD segment terminal for drive output 9				
46	S8		LCD segment terminal for drive output 8				
47	S7		LCD segment terminal for drive output 7				

PIN No.	SIGNAL	I/O	FUNCTION	INITIAL SETTING			
				Li mode normal	Li mode TEST	EVER 5V mode	SS5V mode
48	S6		LCD segment terminal for drive output 6				
49	S5		LCD segment terminal for drive output 5				
50	S4		LCD segment terminal for drive output 4				
51	S3		LCD segment terminal for drive output 3				
52	S2		LCD segment terminal for drive output 2				
53	S1		LCD segment terminal for drive output 1				
54	S0		LCD segment terminal for drive output 0				
55	INT1		Interrupt by CAMERA VD input	HiZ	HiZ	HiZ	HiZ
56	RESET		Reset input	HiZ	HiZ	HiZ	HiZ
57	CL1		System•Clock oscillation circuit input	HiZ	HiZ	HiZ	HiZ
58	V_{DD}		Power input				
59	CL2		System•Clock oscillation circuit output				
60	CMI 3		KEY MATRIX input 3	HiZ	HiZ	HiZ	HiZ
61	CMI 2		KEY MATRIX input 2	HiZ	HiZ	HiZ	HiZ
62	CMI 1		KEY MATRIX input 1	HiZ	HiZ	HiZ	HiZ
63	CMI 0		KEY MATRIX input 0	HiZ	HiZ	HiZ	HiZ
64	$\overline{\text{CMO3}}$		KEY MATRIX drive output 3	H	H		

3-10-3. EVR MICROCOMPUTER MC68HC05N2FU (VC-32P BOARD IC616)

1. Description of Function
   1) EVR control
   2) A.W.B. control
   3) Electronic shutter
2. Pin Function (MC68HC05N2FU)

PIN No.	SIGNAL	I/O	FUNCTION
1	——		——
2	DA SSW	O	Serial change over "H" only during communication with D/D converter
3	$\overline{\text{EVR SCLK}}$	O	Serial clock output
4	EVR SI	I	Serial data input
5	EVR SO	O	Serial data output
6	$\overline{\text{EVR CS}}$	I	Request of communication from DDS
7	L IN	I	LINCS input L : 0 H : 1
8	L OUT	O	LINCS output L : 0 H : 1
9	$\overline{\text{CAM ADJ}}$	I	NORMAL/ADJUST select L : ADJ H : NORMAL
10	NC	—	NC
11	SSW	O	DDS serial select
12 • 13	LD	O	D/A converter LOAD
14	NC	—	NC
15	IN/OUT	I	IN DOOR/OUT DOOR discrimination input H : INDOOR L : OUTDOOR
16	——		
17	V_{DD}		EEPROM read voltage supply: connects to V_{DD}
18			GND
19	——	——	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcasting system selection L : NTSC H : PAL
21	GND		——
22	GND		——
23	GND		——
24 • 25	GND		——
26	GND	—	——
27	GND	—	——
28	CAM 5V	I	Watching of rise of CAMERA power L : CAM OFF H : CAM ON
29	AW IN	I	AWB A/D timer stop Pattern drive interrupt
30	AW ADJ	O	AWB preset data uptake L : NORMAL H : ADJ mode

PIN No.	SIGNAL	I/O	FUNCTION
31	GND	—	————
32	GND	—	————
33	——	—	————
34	S3SW	O	AWB measurement signal select
35	S2SW	O	AWB measurement signal select
36	DISCHG	O	Measurement of timer, Lamp, voltage generation capacitor
37	——	—	————
38	S1SW	O	AWB measurement signal select
39	——	—	————
40	OSC2	O	Output of board on inverter for oscillation
41	OSC1	I	Input of board on inverter for oscillation
42	V_{DD}		Connect to VTR SS5V
43	——		————
44	$\overline{\text{RESET}}$		Reset
45	IRQ		Connect to reset
46	——	—	Connect to reset
47	——	—	Connect to reset
48	$\overline{\text{A/D EN}}$	O	DSI 1bit A/D operation ON/OFF

3-10-4. AF MICROCOMPUTER MC68HC05C4FU (AF-36P BOARD IC802)

1. Explanation of Functions
    1) AF control
    2) EE LOCK (manual Iris)
    3) Power focus
    4) Zoom motor drive

2. Regarding the Auto Focus System of this Equipment (Λ-AF: Picture processing system)

    Without using an external sensor the high frequency component of the video signal (practically Y signal) is microcomputer processing by TTL. and Focus is controlled. Further with this microcomputer EE LOCK function is realized

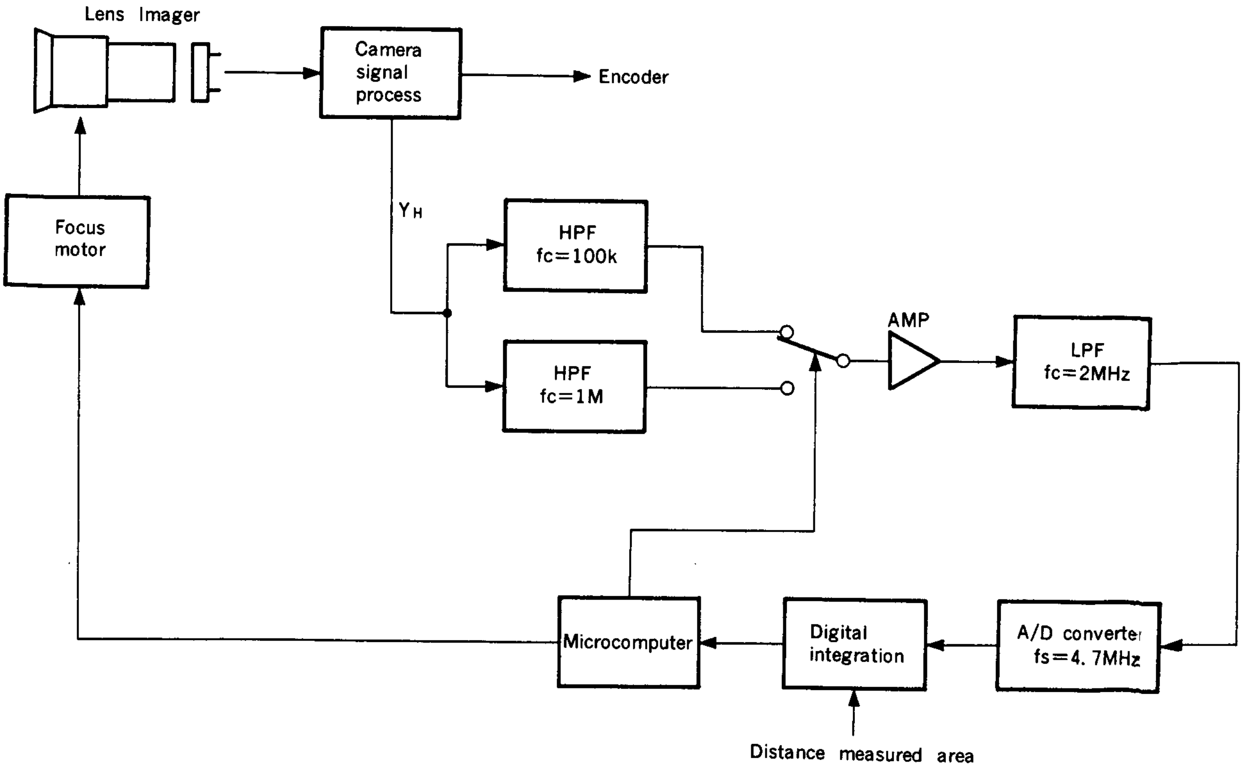
3. Outline of Operation

    The microcomputer takes out from the brightness signal Y the frequency components of 100k-2MHz and 1M—2MHz.

    They are digital integrated for each field.

    The integrated value is called the evaluation value.

    Based upon the concept that, using the evaluation value as the information for auto-focusing, in-focus → the edges of the picture become clear → the high frequency component of the picture increases → the evaluation value is raised, it controls the focus ring searching for the peak of the evaluation value.


Lens Imager
Camera signal process
Encoder
Focus motor
Y_H
HPF fc=100k
HPF fc=1M
AMP
LPF fc=2MHz
Microcomputer
Digital integration
A/D converter fs=4. 7MHz
Distance measured area

4. Pin Function (MC68HC05C4FU)

PIN No.	SIGNAL	I/O	FUNCTION
1	$\overline{\text{SS}}$ OUT	O	EVR data stealthy read timing output (PD5 ss input)
2	IRIS IN/$\overline{\text{OUT}}$	O	Discrimination of in door/out door by iris value. "L" with out door
3	$\overline{\text{EE LOCK}}$	O	EE LOCK, AUTO/MANUAL discrimination
4	AGC COMP	I	EE LOCK AGC COMPARATOR
5	IRIS COMP	I	EE LOCK IRIS COMPARATOR
6	$\overline{\text{LOW CONTRAST}}$	O	LOW CONTRAST at LOW for DDS
7	—	—	
8			NOT USED
9	—	—	
10	—	—	
11	$\overline{\text{ZOOM T}}$	O	Zoom driver TELE instruction by LINCS command
12	$\overline{\text{ZOOM W}}$	O	Zoom driver WIDE instruction by LINCS command
13	Focus N	O	Instruction to focus driver
14	—	—	
15	Focus ∞	O	Instruction to focus driver
16	F SPDϕ	O	Focus SPEED CONTROL ϕbit
17	—	—	
18	F SPD 1	O	Focus SPEED CONTROL 1bit
19	F SPD 2	O	Focus SPEED CONTROL 2bit
20	—	—	
21	F SPD 3	O	Focus SPEED CONTROL 3bit
22	—	—	
23	Vss	—	Connects to GND
24		—	
25	—	—	
26	$\overline{\text{Focus END}}$	I	"L" with focus ring N or ∞
27	—	—	
28	IRIS GAIN	O	Select the loop gain of IRIS DRIVE according to the iris value
29	—	—	
30	FS DRV	O	FOCUS end sensor LED driver control pulse
31	AF SSW	O	BUS select timing output
32	—	—	
33	DA STB	O	D/A CONVERTER data latch for AF
34	PAL/$\overline{\text{NTSC}}$	I	PAL/NTSC Select
35	—	—	
36	$\overline{\text{J STB}}$	O	External display board for data latch
37	XCS	O	Communication request to CXD-1204. Active "L"
38		—	NOT USED
39	—	—	
40			NOT USED
41	MISO	I/O	SPI MASTER : in SLAVE : out

PIN No.	SIGNAL	I/O	FUNCTION
42	MOSI	I/O	SPI MASTER : out SLAVE : in
43	$\overline{\text{SCK}}$	I/O	SPI SERIAL CLOCK
44	——	—	
45	$\overline{\text{SS}}$	I	
46	——	—	
47			
48	$\overline{\text{EVR CS}}$	I	Communication request of EVR data from DDS microcomputer ↓
49	——	—	
50	——	—	
51	$\overline{\text{Focus FG}}$	I	Generation of interrupt with Focus MOTOR FG ↓
52	CLK OUT		
53	——	—	
54	CLK IN	I	EXTERNAL CLOCK IN
55			CAM 4.75V
56	——	—	
57	——	—	
58	——	—	
59	——	—	
60	$\overline{\text{SYS RST}}$	I	RESET Active Low
61	AREA	I	Generation of interrupt with CXD-1204
62			Direct connection to V_{DD} for MC68HC805C4 only
63	WND W/$\overline{\text{N}}$	I	Change over of AF ranging AREA. Connects to V_{DD} with 100kΩ (WIDE FIX)
64	——	—	

3-11. INTERFACE

3-11-1. SYSTEM CONTROL — VIDEO·AUDIO BLOCK INTERFACE

SIGNAL	I/O	PIN No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
SP/LP	O	VA-39 board • IC006 ⑭	∗1	H	H	∗2	∗2	∗2	∗2	∗2	∗1	∗1	∗1	H	H	H	H	∗2	∗2	H	H
VA PB MODE	O	VA-39 board • IC006 ⑬	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE	O	VA-39 board • IC006 ⑫	L	L	L	H	H	L∗3	H	H	H	H	H	L	L	L	L	H	H	L	H
VIDEO MUTE	O	VA-39 board • IC006 ⑪	L	L	L	L	L	L∗3	L	L	L	L	L	L	L	L	L	L	L	L	L
CAM/$\overline{\text{LINE}}$	O	VA-39 board • IC006 ⑦	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H
JOG	O	VA-39 board • IC006 ⑥	L	L	L	H	H	L	H	H	H	H	H	L	L	L	L	L	H	L	H
DATA SCREEN	O	VA-39 board • IC006 ⑤	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5	∗5
POWER SAVE	O	VA-39 board • IC006 ④	H	H	H	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
JOG VD	O	SS-82P board • IC401 (76)	L	L	L	∗6	∗6	H	∗6	∗6	∗6	∗6	∗6	L	L	L	L	L	H	L	H
RP PB MODE	O	SS-82P board • IC401 (77)	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	SS-82P board • IC401 (78)	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{1/2 RF SWP}}$	O	SS-82P board • IC401 (79)	H/L	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7	∗7
RF SWP	O	SS-82P board • IC401 (80)	H/L	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8	∗8
SEL2	O	SS-82P board • IC401 ①	H	∗9	∗9	∗10	∗10	∗11	∗10	∗10	L	∗12	∗13	∗9	H	H	∗9	∗11	∗14	∗11	∗14
SEL1	O	SS-82P board • IC401 ②	L	∗9	∗9	∗10	∗10	∗11	∗10	∗10	L	∗12	∗13	∗9	L	L	∗9	∗11	∗14	∗11	∗14
PB 2B MUTE	O	SS-82P board • IC401 ③	L	∗15	∗15	∗15	∗15	∗15	∗15	∗15	∗15	∗15	∗15	L	L	L	L	∗15	∗15	∗15	∗15
PB 1B MUTE	O	SS-82P board • IC401 ④																			
PB 2A MUTE	O	SS-82P board • IC401 ⑤																			
PB 1A MUTE	O	SS-82P board • IC401 ⑥																			
$\overline{\text{REC2B}}$	O	SS-82P board • IC401 ⑦	L	H	H	H	H	H	H	H	H	H	H	∗16	H	H	∗16	H	H	H	H
$\overline{\text{REC1B}}$	O	SS-82P board • IC401 ⑧																			
$\overline{\text{REC2A}}$	O	SS-82P board • IC401 ⑨																			
$\overline{\text{REC1A}}$	O	SS-82P board • IC401 ⑩																			
$\overline{\text{VIDEO CS}}$	O	SS-82P board • IC401 ⑮	"L" Pulse of V cycle																		
$\overline{\text{AUDIO STB}}$	O	SS-82P board • IC401 ⑯																			

SIGNAL	I/O	PIN No.	V T R Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
COSMO SO	O	SS-82P board · IC401 ㊳	Pulse of V cycle																		
$\overline{\text{COSMO SCK}}$	I/O	SS-82P board · IC401 ㊴																			
CUE/REV SP/$\overline{\text{LP}}$	I	SS-82P board · IC401 (59)	H/L	*17	*17	*17	*17	H/L	*17	*17	H/L	H/L	H/L	H/L	H/L	H/L	H/L	H/L	*17	H/L	*17
CLOG	I	SS-82P board · IC401 (57)	H	*18	*18	*18	*18	*18	*18	*18	*18	*18	*18	H	H	H	H	*18	*18	*18	*18
COMPOSITE SYNC	I	SS-82P board · IC401 (58)	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19	*19

*1. Outputs the immediately preceding discrimination result. "H" for SP mode, "L" for LP mode.
*2. Outputs the discrimination result of playback tape recording mode. "H" for SP mode, "L" for LP mode.
*3. "H" at no signal part of tape.
*5. With no relation to mode, each pushing DATA SCREEN switch changes over L⇄H.
*6. Pseudo VD signal.
*7. 12.5Hz duty 50% pulse (synchronizing to drum rotation)
*8. 25Hz duty 50% pulse (synchronizing to drum rotation)
*9. Refer to the time chart 1
*10. Refer to the time chart 2
*11. Refer to the time chart 3
*12. Refer to the time chart 5
*13. Refer to the time chart 5
*14. Refer to the time chart 4
*15. Refer to the time chart 6
*16. Refer to the time chart 7
*17. "H" at the SP recorded part and "L" at the LP recorded part of tape.
*18. "H" at the no record part or drop-out part of tape. Head clog detection signal input.
*19. Input of composite synchronous signal which separated from camera video signal or playback video signal. (Polarity +)

3-11-2. SYSTEM CONTROL — SERVO BLOCK INTERFACE

SIGNAL	I/O	PIN No.	V T R Mode													CAMERA Mode						
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW		
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS	
T. REEL FG	I	SS-82P board • IC401 ㊾	—	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1	
S. REEL FG	I	SS-82P board • IC401 ㊿	—	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	—	—	*1	*1	*1	*1	*1	
ATF ERROR	I	SS-82P board • IC401 (51)	—	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*11	*2	*2	*11	*2	*2	*2	*2	
DRUM PG	I	SS-82P board • IC401 (55) (60)	—	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	
DRUM FG	I	SS-82P board • IC401 (61)	—	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	
CAP FG	I	SS-82P board • IC401 (62) (69)	—	*4	*4	*4	*4	*4	*4	*4	—	*4	*4	*4	—	—	*4	*4	*4	*4	*4	
DRUM STEP	O	SS-82P board • IC401 (63)	L	*5	*5	L	L	*5	L	L	L	L	L	*5	L	*5	*5	L	L	L	L	
DRUM $\overline{\text{FWD}}$/RVS	O	SS-82P board • IC401 (64)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	etc *6
CAP ERH	O	SS-82P board • IC401 (65)	L	*7	*7	L	*7	*7	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM D/A	O	SS-82P board • IC401 (66)	—	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	
CAP PWM	O	SS-82P board • IC401 (67)	—	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	L	L	*9	*9	*9	*9	*9	
LIM CONT	O	SS-82P board • IC401 (68)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	etc *10
DRUM ON	O	SS-82P board • IC401 (75)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	

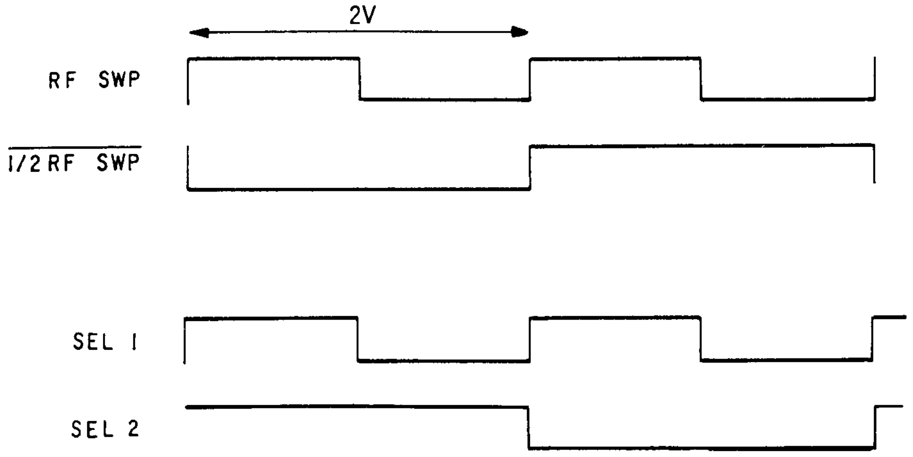
*1. FG input for reel rotation detection (analog input)
*2. Input of ATF servo error voltage
*3. Input for drum motor rotation, phase detection
*4. Input for capstan motor rotation detection
*5. Usually "L". "H" only when the drum motor is started.
*6. Usually "L". Temporarily "H" only at the time of LOAD (drum rotates reversely)
*7. Output of capstan start, blake pulse.
*8. Drum servo output
*9. Capstan servo output.
*10. Usually "L". "H" only during linear skating of LOAD/UNLOAD.
(prevention of finger pinching)
*11. M (about 2.5Vdc)

Interface (others)

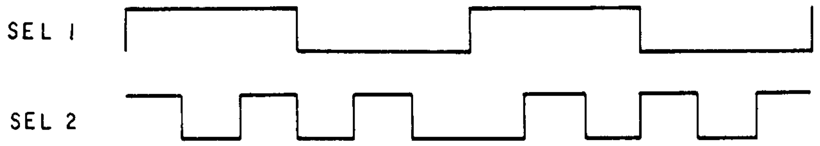
AV_{REF} SS-82P • IC401 (53) Reference voltage source for A/D converter
AV_{DD} SS-82P • IC401 (54) Power source for A/D converter
V_{DD} SS-82P • IC401 (72) Power source for Digital system

3-11-3. TIME CHART

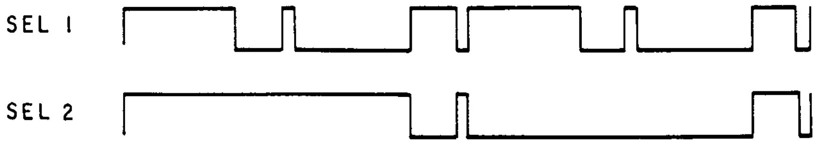
Time chart 1
FF, REW, REC


2V
RF SWP
1/2 RF SWP
SEL 1
SEL 2

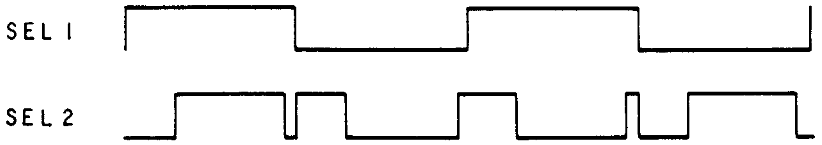
Time chart 2
FR-SEARCH (CUE/REV)
PICTURE-SEARCH (CUE/REV)



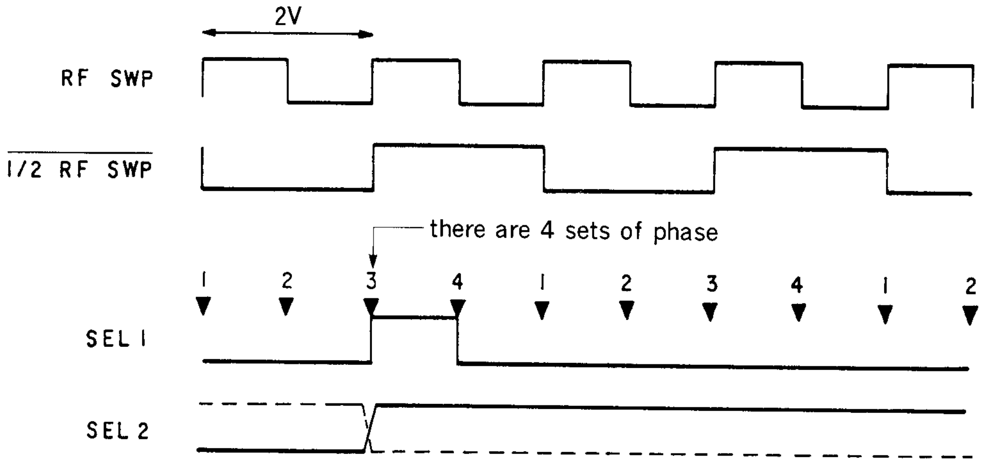
Time chart 3
PB, EDIT-SEARCH (FWD)
REC-REVIEW (FWD)



Time chart 4
EDIT-SEARCH (RVS)
REC-REVIEW (RVS)

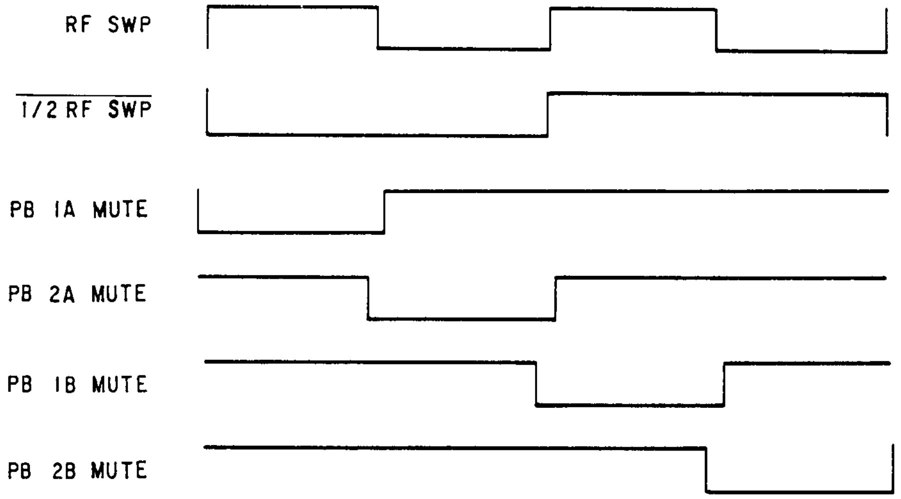


Time chart 5
FRAME, SLOW

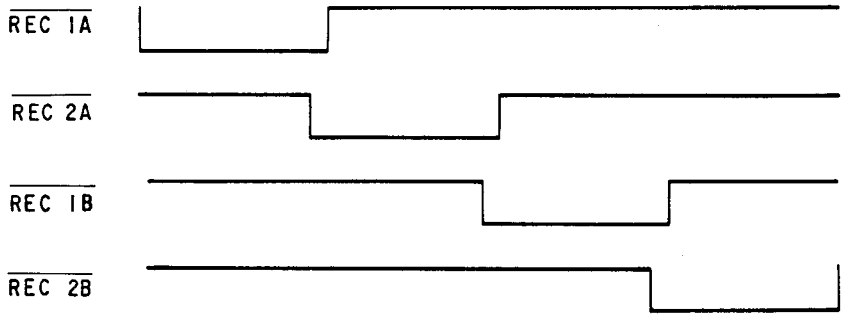

2V
RF SWP
1/2 RF SWP
there are 4 sets of phase
1
2
3
4
1
2
3
4
1
2
SEL 1
SEL 2

- with FRAME, 1 pulse generates at each pushing of frame feeder
- with SLOW, 1 pulse generates once a 10V

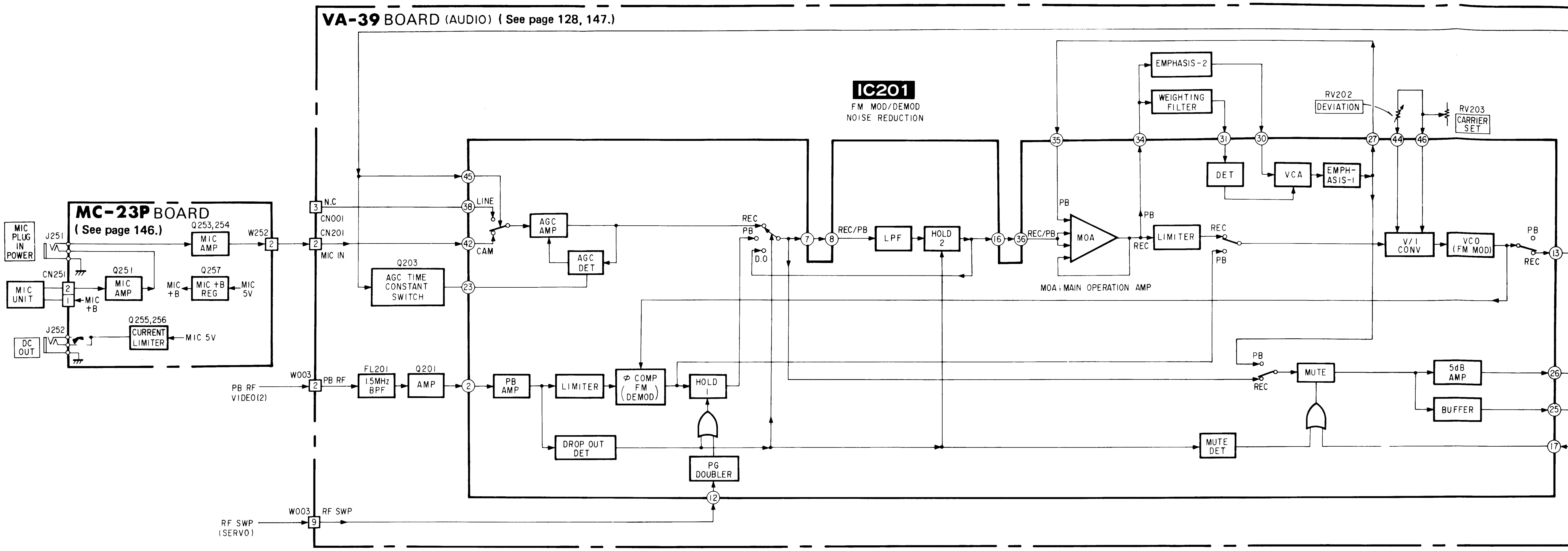
Time chart 6


RF SWP
1/2 RF SWP
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE

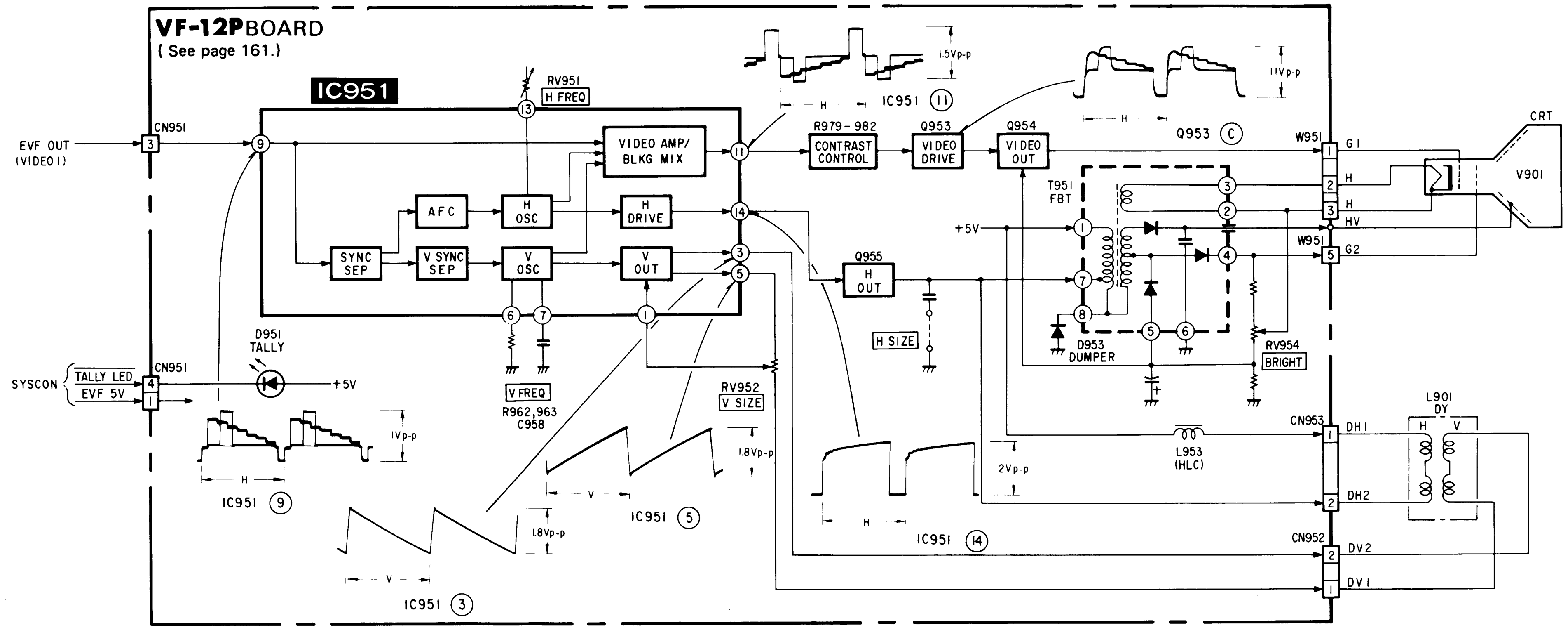
Time chart 7

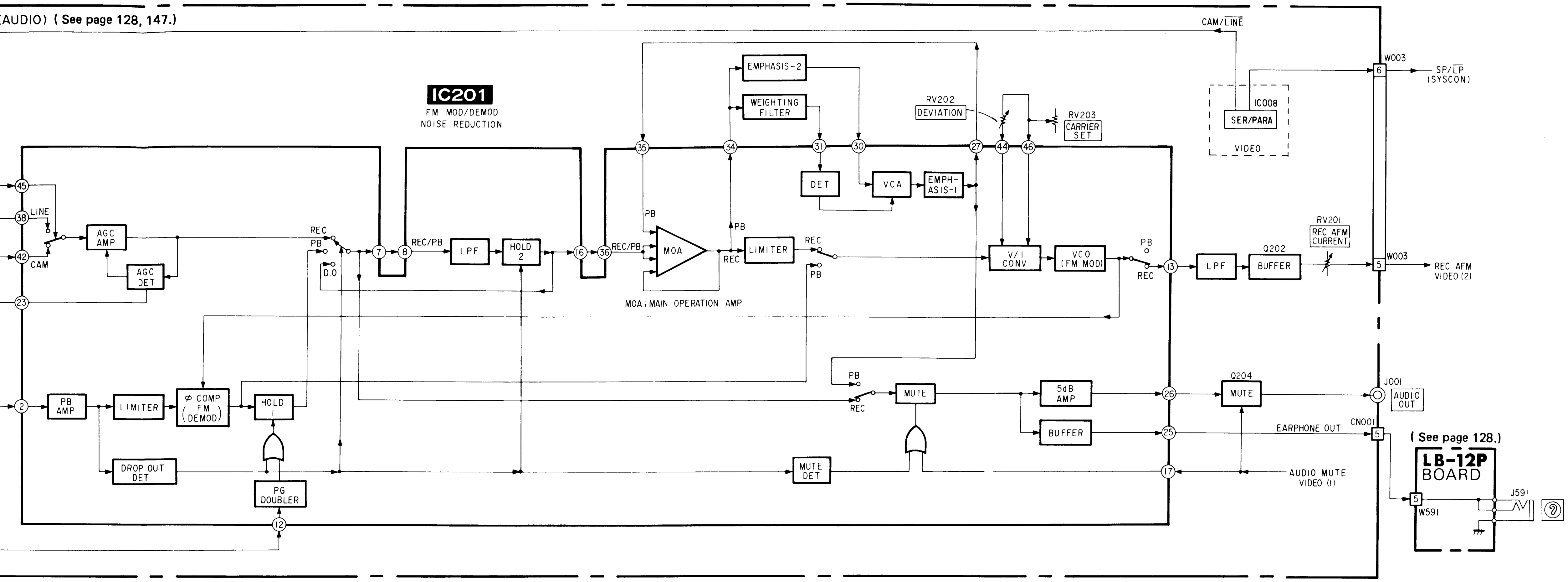

REC 1A
REC 2A
REC 1B
REC 2B

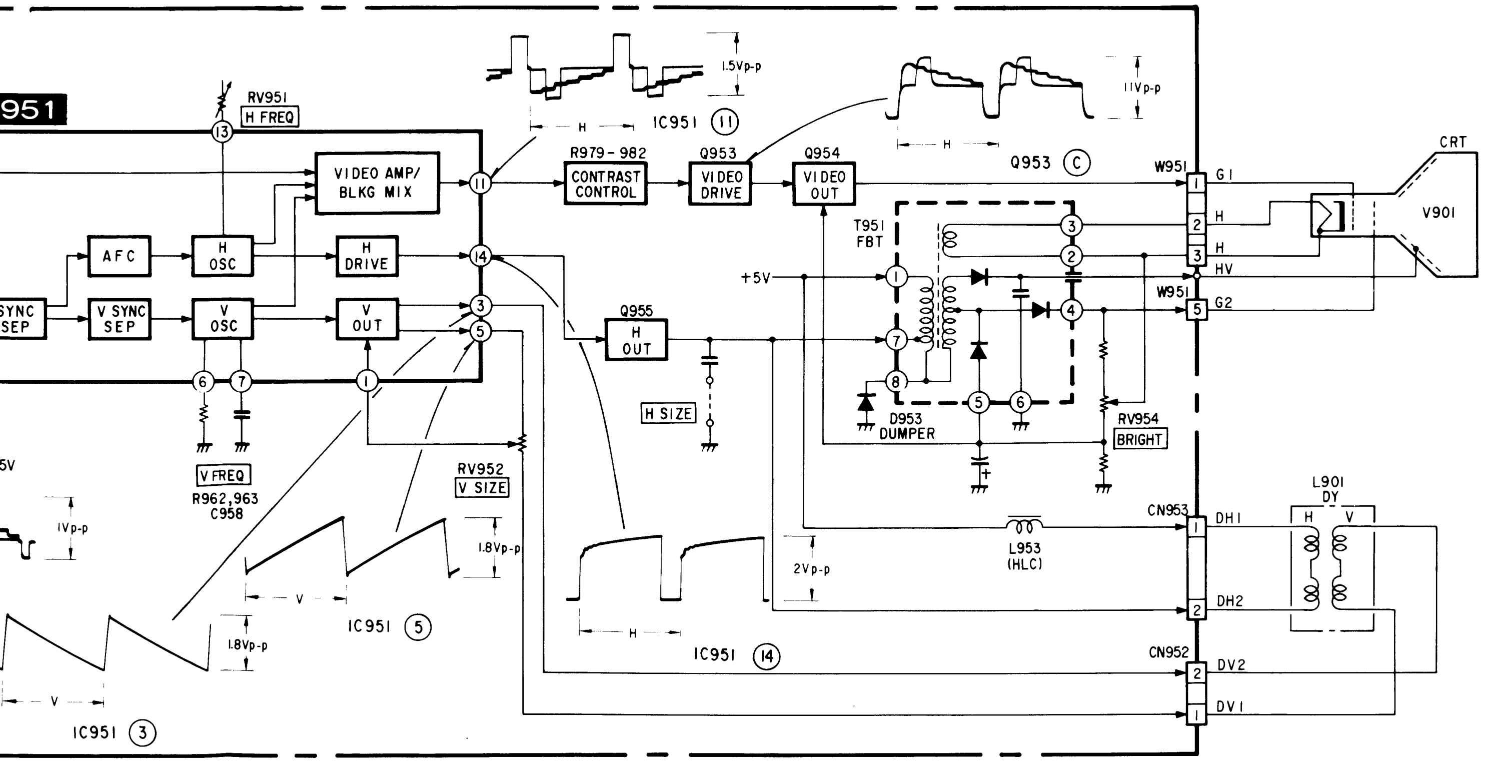
3-12. AUDIO BLOCK DIAGRAM


VA-39 BOARD (AUDIO) (See page 128, 147.)
MC-23P BOARD
(See page 146.)
MIC PLUG IN POWER
J251
CN251
MIC UNIT
J252
DC OUT
Q253,254
MIC AMP
W252
Q251
MIC AMP
Q257
MIC +B REG
MIC +B
MIC 5V
Q255,256
CURRENT LIMITER
MIC 5V
CN001
N.C
CN201
MIC IN
Q203
AGC TIME CONSTANT SWITCH
LINE
CAM
AGC AMP
AGC DET
REC
PB
D.O
IC201
FM MOD/DEMOD
NOISE REDUCTION
REC/PB
LPF
HOLD 2
MOA
MOA : MAIN OPERATION AMP
LIMITER
EMPHASIS-2
WEIGHTING FILTER
DET
VCA
EMPH-ASIS-1
RV202
DEVIATION
RV203
CARRIER SET
V/I CONV
VCO (FM MOD)
PB RF VIDEO(2)
W003
PB RF
FL201
1.5MHz BPF
Q201
AMP
PB AMP
LIMITER
φ COMP (FM DEMOD)
HOLD 1
DROP OUT DET
PG DOUBLER
MUTE
MUTE DET
5dB AMP
BUFFER
RF SWP (SERVO)
RF SWP
45
38
42
23
2
7
8
16
36
35
34
31
30
27
44
46
13
26
25
17
12
3
9

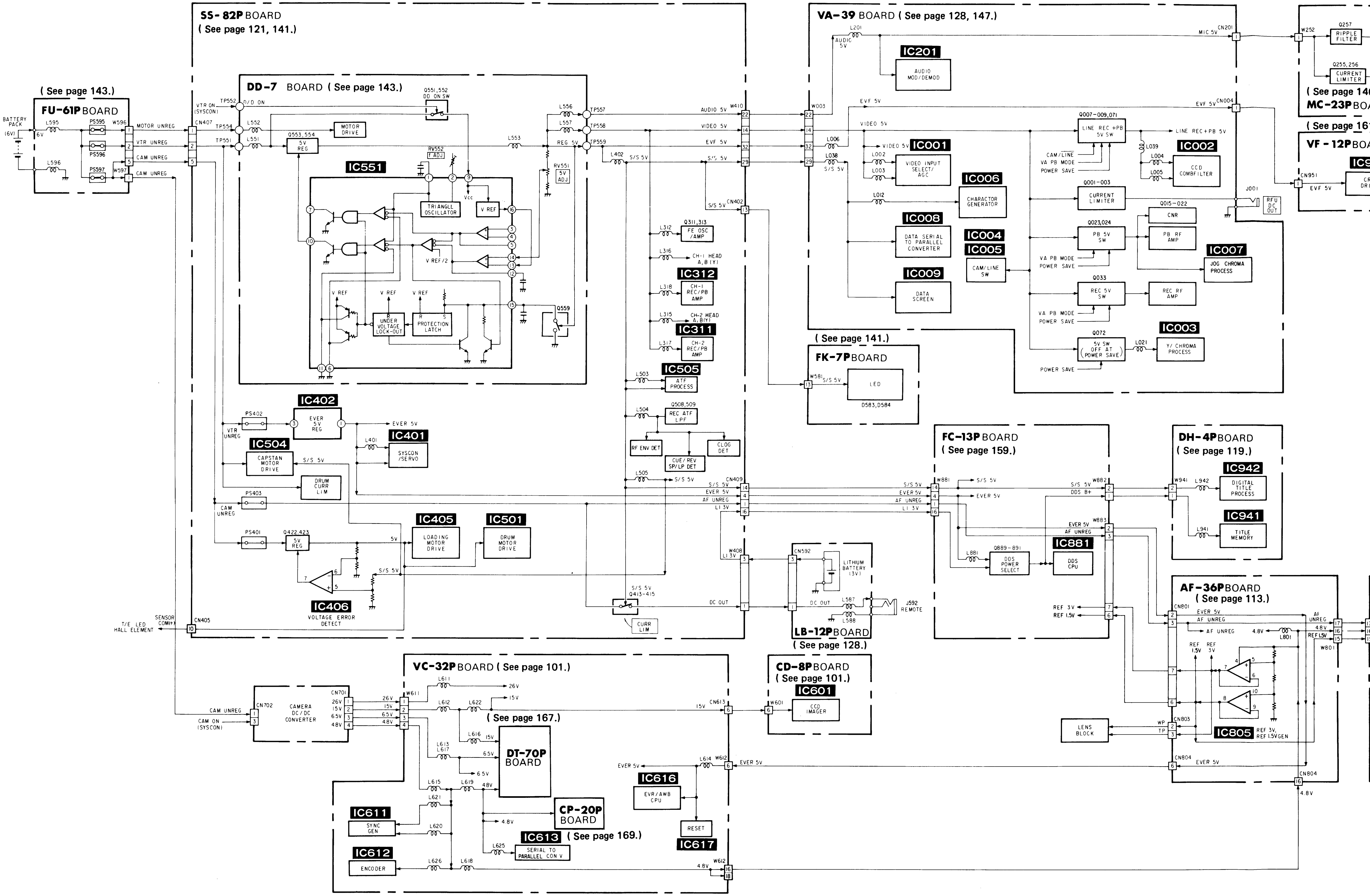
3-13. VIEWFINDER BLOCK DIAGRAM

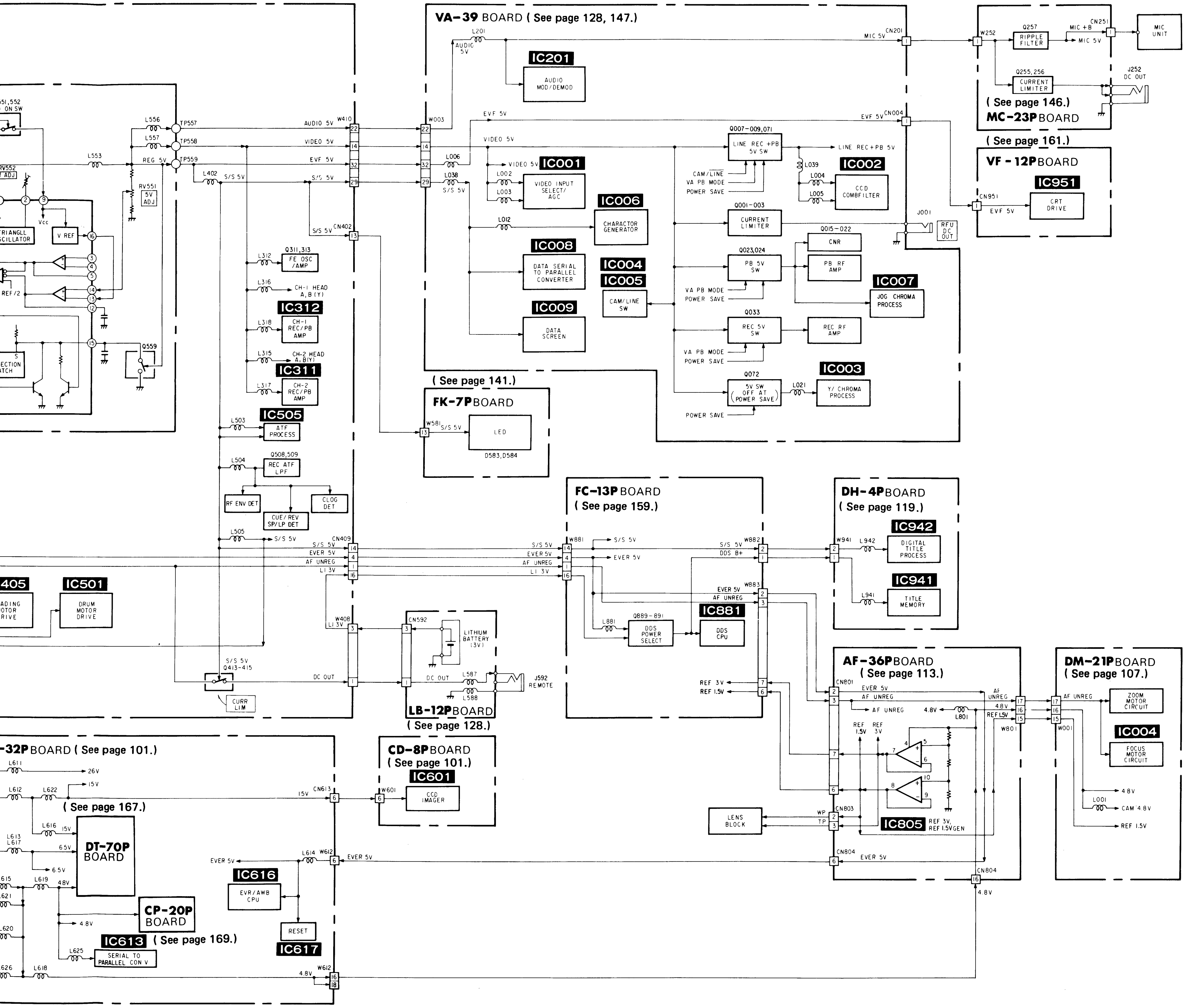

VF-12P BOARD
(See page 161.)
IC951
EVF OUT (VIDEO 1)
CN951
SYSCON
TALLY LED
EVF 5V
D951 TALLY
+5V
RV951
H FREQ
AFC
H OSC
SYNC SEP
V SYNC SEP
V OSC
VIDEO AMP/ BLKG MIX
H DRIVE
V OUT
V FREQ
R962,963 C958
RV952
V SIZE
R979-982
CONTRAST CONTROL
Q953
VIDEO DRIVE
Q954
VIDEO OUT
Q955
H OUT
H SIZE
T951 FBT
+5V
D953 DUMPER
RV954
BRIGHT
W951
G1
H
H
HV
G2
CRT
V901
CN953
DH1
DH2
CN952
DV2
DV1
L953 (HLC)
L901 DY
H V
1.5Vp-p
H
IC951 ⑪
11Vp-p
Q953 Ⓒ
1Vp-p
IC951 ⑨
1.8Vp-p
V
IC951 ③
1.8Vp-p
IC951 ⑤
2Vp-p
IC951 ⑭


(AUDIO) (See page 128, 147.)
IC201
FM MOD/DEMOD
NOISE REDUCTION
CAM/LINE
EMPHASIS-2
WEIGHTING FILTER
RV202
DEVIATION
RV203
CARRIER SET
IC008
SER/PARA
VIDEO
W003
SP/LP (SYSCON)
LINE
CAM
AGC AMP
AGC DET
REC
PB
D.O
REC/PB
LPF
HOLD 2
MOA
MOA: MAIN OPERATION AMP
LIMITER
DET
VCA
EMPH-ASIS-1
V/I CONV
VCO (FM MOD)
RV201
REC AFM CURRENT
Q202
BUFFER
REC AFM VIDEO (2)
PB AMP
φ COMP (FM DEMOD)
HOLD 1
DROP OUT DET
PG DOUBLER
MUTE DET
MUTE
5dB AMP
Q204
J001
AUDIO OUT
EARPHONE OUT
CN001
AUDIO MUTE VIDEO (1)
(See page 128.)
LB-12P BOARD
W591
J591
45
38
42
23
2
7
8
16
36
35
34
31
30
27
44
46
13
26
25
17
12
6
5


951
RV951
H FREQ
13
VIDEO AMP/ BLKG MIX
AFC
H OSC
H DRIVE
SYNC SEP
V SYNC SEP
V OSC
V OUT
V FREQ
R962,963 C958
RV952
V SIZE
IC951 ⑪
1.5Vp-p
H
11Vp-p
Q953 Ⓒ
R979-982
CONTRAST CONTROL
Q953
VIDEO DRIVE
Q954
VIDEO OUT
T951 FBT
+5V
Q955
H OUT
H SIZE
D953 DUMPER
RV954
BRIGHT
W951
G1
H
HV
G2
CRT
V901
L901 DY
CN953
DH1
DH2
L953 (HLC)
CN952
DV2
DV1
1Vp-p
1.8Vp-p
2Vp-p
V
IC951 ⑤
IC951 ⑭
IC951 ③
5V

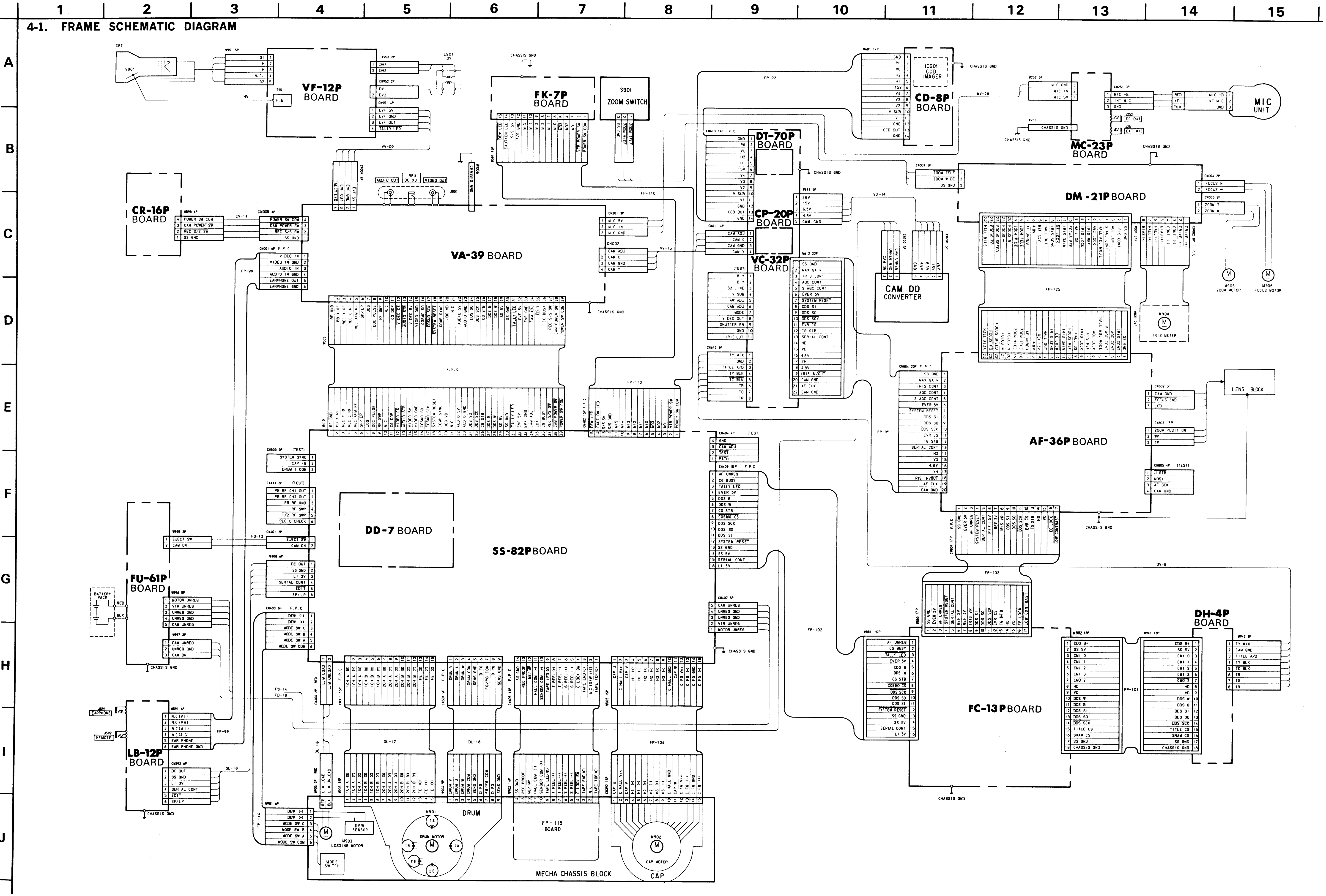
3-14. POWER BLOCK DIAGRAM


BATTERY PACK (6V)
(See page 143.)
FU-61P BOARD
MOTOR UNREG
VTR UNREG
CAM UNREG
SS-82P BOARD
(See page 121, 141.)
DD-7 BOARD (See page 143.)
VTR ON (SYSCON)
D/D ON
Q551,552 DD ON SW
Q553,554 5V REG
MOTOR DRIVE
RV552 f ADJ
IC551
TRIANGLL OSCILLATOR
V REF
V REF/2
UNDER VOLTAGE LOCK-OUT
PROTECTION LATCH
Q559
RV551 5V ADJ
AUDIO 5V
VIDEO 5V
EVF 5V
REG 5V
S/S 5V
Q311,313 FE OSC /AMP
CH-1 HEAD A,B (Y)
IC312
CH-1 REC/PB AMP
CH-2 HEAD A,B(Y)
IC311
CH-2 REC/PB AMP
IC505
ATF PROCESS
Q508,509 REC ATF LPF
RF ENV DET
CUE/REV SP/LP DET
CLOG DET
IC402
EVER 5V REG
EVER 5V
IC401
SYSCON /SERVO
IC504
CAPSTAN MOTOR DRIVE
DRUM CURR LIM
CAM UNREG
IC405
LOADING MOTOR DRIVE
IC501
DRUM MOTOR DRIVE
Q422,423 5V REG
IC406
VOLTAGE ERROR DETECT
S/S 5V Q413-415
CURR LIM
DC OUT
SENSOR COM(+)
T/E LED HALL ELEMENT
VA-39 BOARD (See page 128, 147.)
IC201
AUDIO MOD/DEMOD
MIC 5V
Q007-009,071 LINE REC +PB 5V SW
LINE REC+PB 5V
IC001
VIDEO INPUT SELECT/ AGC
IC002
CCD COMBFILTER
IC006
CHARACTOR GENERATOR
Q001-003 CURRENT LIMITER
Q015-022 CNR
Q023,024 PB 5V SW
PB RF AMP
IC007
JOG CHROMA PROCESS
IC008
DATA SERIAL TO PARALLEL CONVERTER
IC004
IC005
CAM/LINE SW
IC009
DATA SCREEN
Q033 REC 5V SW
REC RF AMP
IC003
Q072 5V SW OFF AT POWER SAVE
Y/ CHROMA PROCESS
CAM/LINE
VA PB MODE
POWER SAVE
J001 RFU DC OUT
(See page 141.)
FK-7P BOARD
LED D583,D584
Q257 RIPPLE FILTER
Q255,256 CURRENT LIMITER
(See page 14
MC-23P BO
(See page 16
VF-12P BO
FC-13P BOARD (See page 159.)
Q889-891 DDS POWER SELECT
IC881
DDS CPU
REF 3V
REF 1.5V
DH-4P BOARD (See page 119.)
IC942
DIGITAL TITLE PROCESS
IC941
TITLE MEMORY
LB-12P BOARD (See page 128.)
LITHIUM BATTERY (3V)
J592 REMOTE
AF-36P BOARD (See page 113.)
AF UNREG
IC805
REF 3V, REF 1.5VGEN
LENS BLOCK
VC-32P BOARD (See page 101.)
CAMERA DC/DC CONVERTER
CAM ON (SYSCON)
26V
15V
6.5V
4.8V
(See page 167.)
DT-70P BOARD
CP-20P BOARD
(See page 169.)
IC611
SYNC GEN
IC612
ENCODER
IC613
SERIAL TO PARALLEL CON V
IC616
EVR/AWB CPU
IC617
RESET
CD-8P BOARD (See page 101.)
IC601
CCD IMAGER


VA-39 BOARD (See page 128, 147.)
IC201
AUDIO MOD/DEMOD
IC001
VIDEO INPUT SELECT/ AGC
IC006
CHARACTOR GENERATOR
IC008
DATA SERIAL TO PARALLEL CONVERTER
IC009
DATA SCREEN
IC004
IC005
CAM/LINE SW
Q007-009,071
LINE REC +PB 5V SW
LINE REC+PB 5V
IC002
CCD COMBFILTER
Q001-003
CURRENT LIMITER
Q015-022
CNR
Q023,024
PB 5V SW
PB RF AMP
IC007
JOG CHROMA PROCESS
Q033
REC 5V SW
REC RF AMP
IC003
Q072
5V SW OFF AT POWER SAVE
Y/ CHROMA PROCESS
CAM/LINE
VA PB MODE
POWER SAVE
J001
RFU DC OUT
MIC 5V
EVF 5V
VIDEO 5V
AUDIO 5V
S/S 5V
CN201
CN004
W003
(See page 146.)
MC-23P BOARD
Q257
RIPPLE FILTER
Q255,256
CURRENT LIMITER
MIC +B
MIC 5V
CN251
MIC UNIT
J252 DC OUT
W252
(See page 161.)
VF - 12P BOARD
IC951
CRT DRIVE
CN951
EVF 5V
(See page 141.)
FK-7P BOARD
W581
LED
D583,D584
FC-13P BOARD
(See page 159.)
W881
W882
W883
S/S 5V
EVER 5V
DDS B+
AF UNREG
Q889-891
DDS POWER SELECT
IC881
DDS CPU
L881
REF 3V
REF 1.5V
DH-4P BOARD
(See page 119.)
IC942
DIGITAL TITLE PROCESS
IC941
TITLE MEMORY
W941
L942
L941
AF-36P BOARD
(See page 113.)
CN801
CN803
CN804
IC805
REF 3V, REF 1.5VGEN
L801
4.8V
WP
TP
LENS BLOCK
W801
DM-21P BOARD
(See page 107.)
ZOOM MOTOR CIRCUIT
IC004
FOCUS MOTOR CIRCUIT
W001
L001
CAM 4.8V
REF 1.5V
AF UNREG
TP557
TP558
TP559
L556
L557
L553
L402
REG 5V
RV551 5V ADJ
RV552 ADJ
V REF
Vcc
TRIANGLL OSCILLATOR
REF/2
Q559
W410
CN402
Q311,313
FE OSC /AMP
L312
L316
CH-1 HEAD A,B(Y)
IC312
CH-1 REC/PB AMP
L318
L315
CH-2 HEAD A,B(Y)
IC311
CH-2 REC/PB AMP
L317
IC505
ATF PROCESS
L503
Q508,509
REC ATF LPF
L504
RF ENV DET
CLOG DET
CUE/REV SP/LP DET
L505
CN409
LI 3V
405
IC501
DRUM MOTOR DRIVE
W408
S/S 5V Q413-415
CURR LIM
DC OUT
CN592
LITHIUM BATTERY (3V)
L587
L588
J592 REMOTE
LB-12P BOARD
(See page 128.)
CD-8P BOARD
(See page 101.)
IC601
CCD IMAGER
W601
-32P BOARD (See page 101.)
L611
26V
L612
L622
15V
CN613
(See page 167.)
L616
L613
L617
6.5V
DT-70P BOARD
L619
4.8V
CP-20P BOARD
IC613
(See page 169.)
SERIAL TO PARALLEL CON V
L625
L618
L614
W612
EVER 5V
IC616
EVR/AWB CPU
RESET
IC617

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


VF-12P BOARD
FK-7P BOARD
S901 ZOOM SWITCH
IC601 CCD IMAGER
CD-8P BOARD
MC-23P BOARD
MIC UNIT
CR-16P BOARD
VA-39 BOARD
DT-70P BOARD
CP-20P BOARD
VC-32P BOARD
CAM DD CONVERTER
DM-21P BOARD
M905 ZOOM MOTOR
M906 FOCUS MOTOR
M904 IRIS METER
LENS BLOCK
AF-36P BOARD
DD-7 BOARD
SS-82P BOARD
FU-61P BOARD
BATTERY PACK
LB-12P BOARD
FC-13P BOARD
DH-4P BOARD
DRUM
M901 DRUM MOTOR
M903 LOADING MOTOR
DEW SENSOR
MODE SWITCH
FP-115 BOARD
M902 CAP MOTOR
CAP
MECHA CHASSIS BLOCK
CHASSIS GND

4-2. PRINTE

THIS NOTE
AND SCHE
(In addition

- **For printed**
- ⊗ : Throu
- ▒ : Patter
- ▓ : Patter
- Circled num
- The parts w

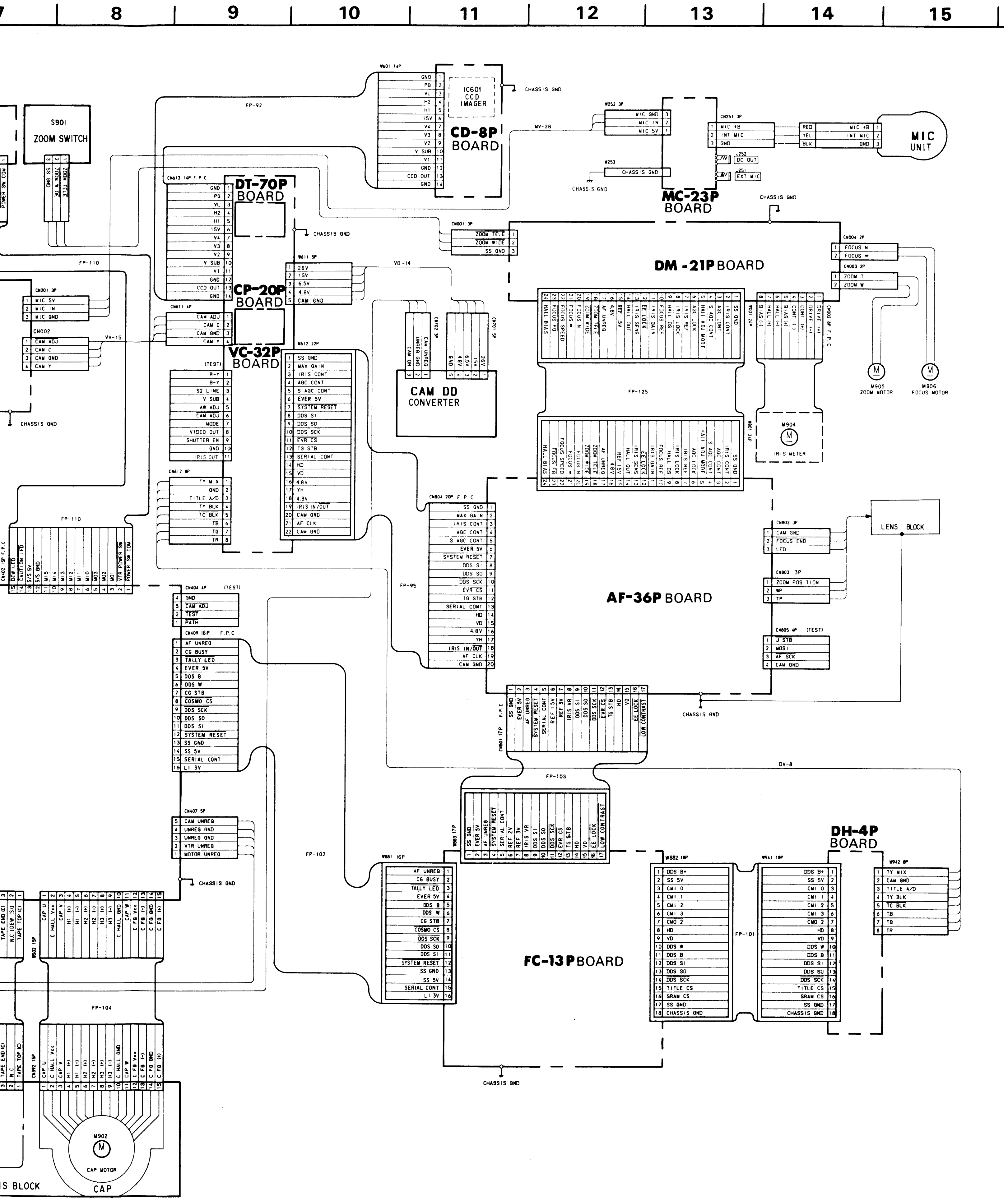
Caution:
Pattern face s
(Conductor S
Parts face sid
(Component

- **For schema**
- Caution wh
  New parts r
  Be careful
  because it is
- All resistor
- All registors
  kΩ: 1000Ω
- All capacito
  50V or less
  tantalums.
- All variable
  unless other
- : nonf
- : fusib
- ☐ : pane
- △ : inter
- The parts wi
- ☐ : adjus
- ▬ : B + L
- Circled num
- : IN/O

Note: The co
line wit
Replace

When indicat
ence numbe
the board nam

* indicated b


7
8
9
10
11
12
13
14
15
S901
ZOOM SWITCH
IC601
CCD
IMAGER
CD-8P
BOARD
MC-23P
BOARD
MIC
UNIT
DT-70P
BOARD
CP-20P
BOARD
VC-32P
BOARD
DM-21P BOARD
CAM DD
CONVERTER
AF-36P BOARD
LENS BLOCK
M904
IRIS METER
M905
ZOOM MOTOR
M906
FOCUS MOTOR
FC-13P BOARD
DH-4P
BOARD
M902
CAP MOTOR
CAP
CHASSIS GND
FP-92
FP-110
FP-125
FP-95
FP-102
FP-103
FP-101
FP-104
VD-14
VV-15
MV-28
DV-8

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ⊗ : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ■ : Pattern of the rear side.*
- Circled numbers refer to waveforms.
- The parts with the indication of NOMT are not mounted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/16W unless otherwise noted.
- All registors in ohms, 1/10W unless otherwise noted on VF-12P board.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- –▭– : nonflammable resistor.
- –▭– : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- The parts with the indication of NOMT are not mounted.
- ☐ : adjustment for repair.*
- ━━ : B + Line*
- Circled numbers refer to waveforms.*
- ⇨ : IN/OUT direction of (+, –) B line.*

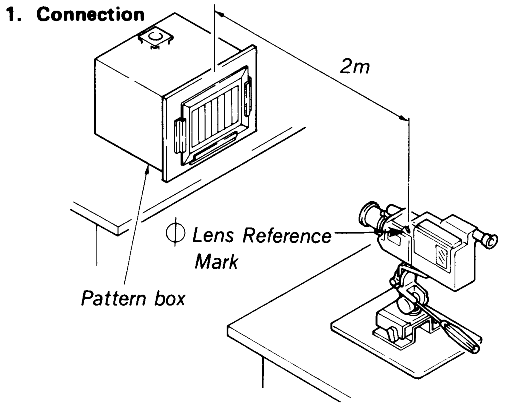
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

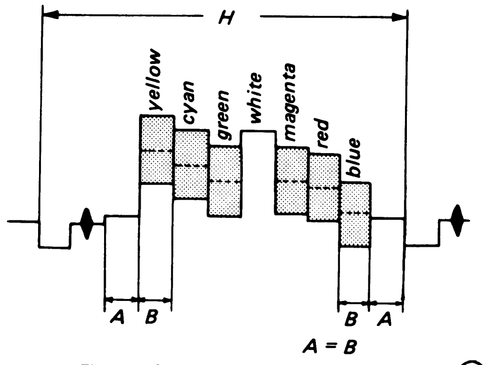
* indicated by the color red.

- **For voltage and waveforms.**
- Voltage and waveform measuring conditions:*
  (1) Sample object: Pattern box color bars.*
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).*

1. **Connection**


2m
Lens Reference Mark
Pattern box

2. **Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.**


H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A

A = B

Fig. a Camera output waveform of Pin ⑧ of 〔TEST〕 connector on VC-32P board.

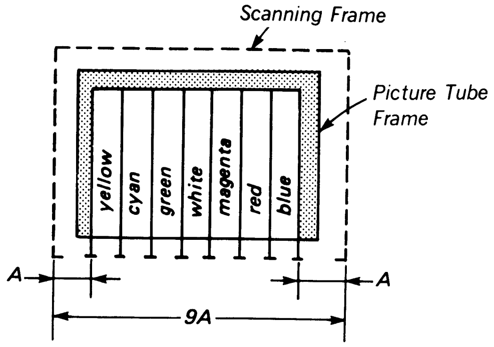
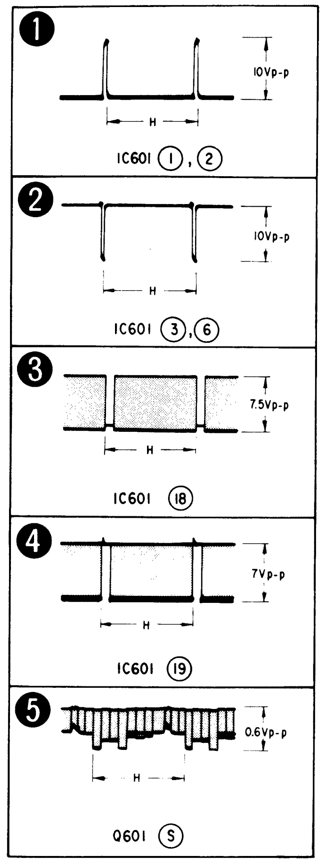

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

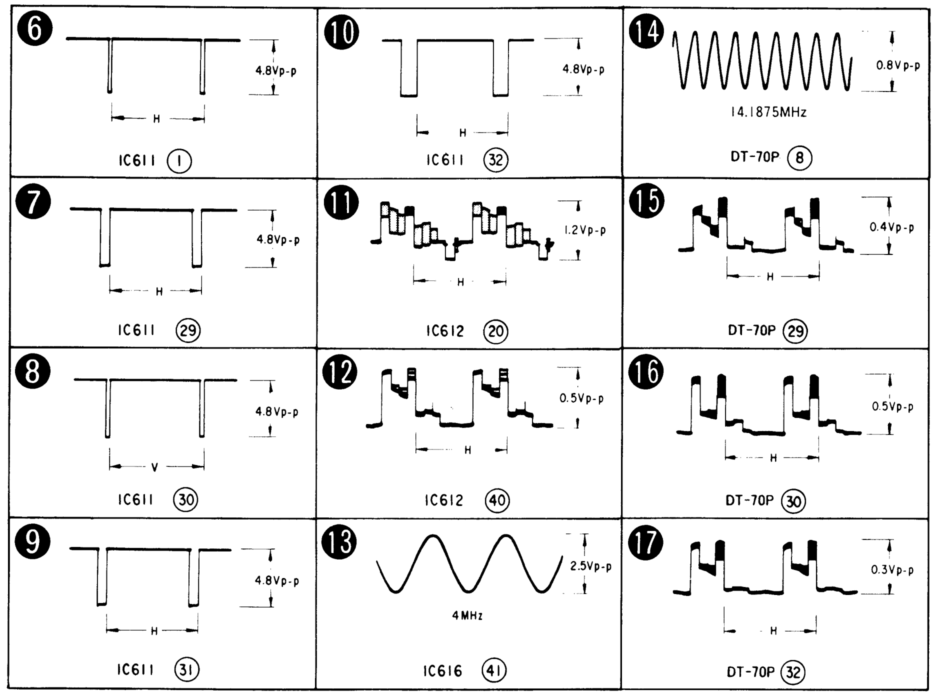
VC-32P (CAMERA PROCESS), CD-8P (CCD IMAGER) PRINTED WIRING BOARDS

—Ref. No. VC-32P BOARD: 1,000 series, CD-8P BOARD: 4,000 series—

CD-8P BOARD

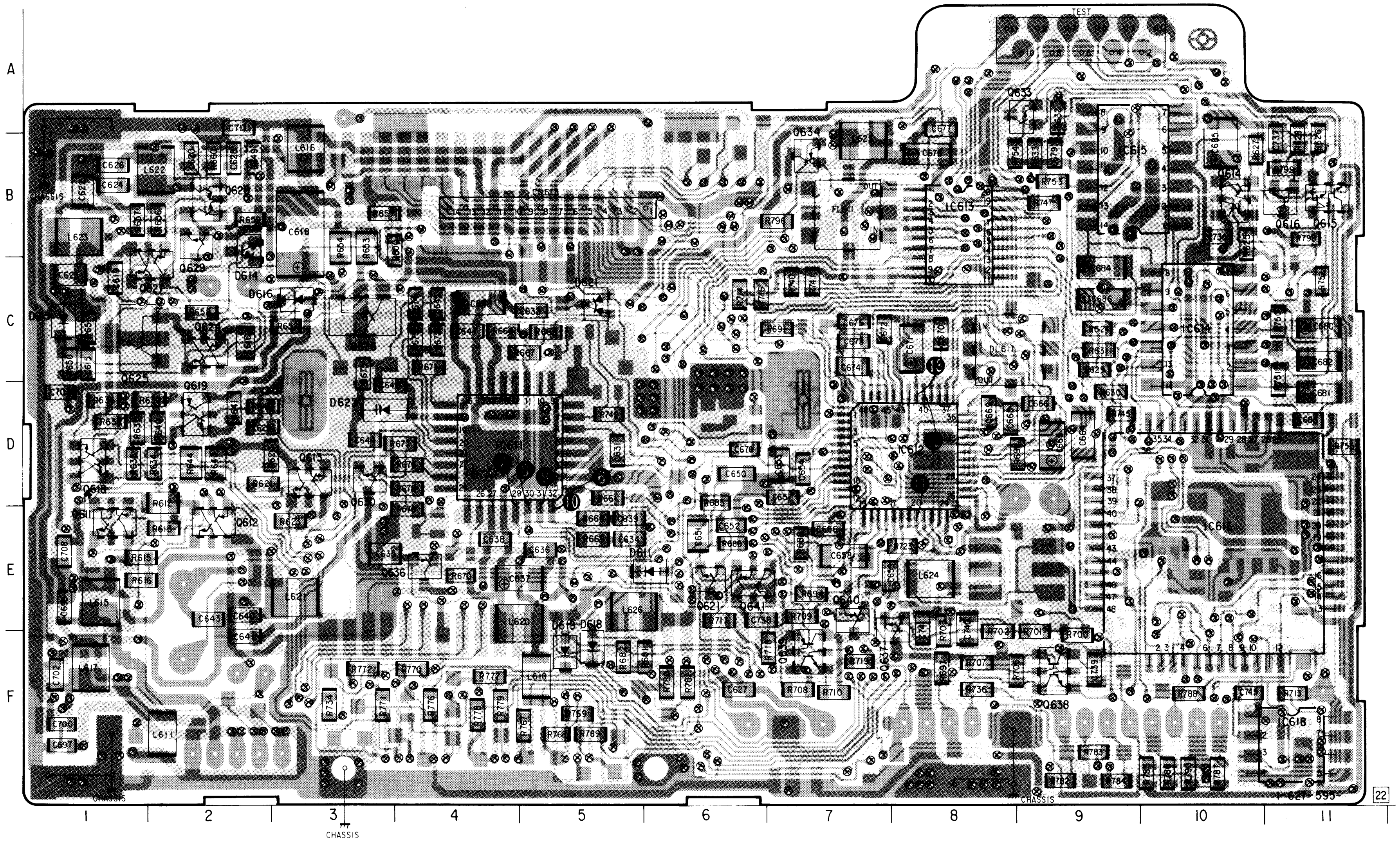


VC-32P BOARD



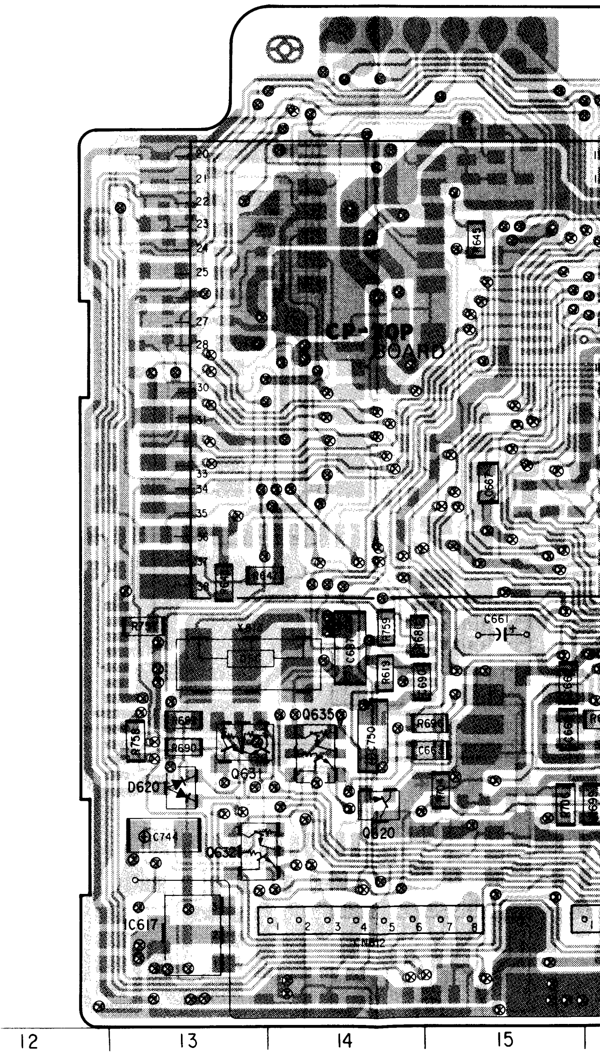
CN611	F-16
CN612	F-14
CN613	B-5
D611	E-5
D614	B-2
D615	C-1
D616	C-3
D618	F-5
D619	F-5
D620	E-13
D621	C-5
D622	D-3
D623	F-16
IC611	D-4
IC612	D-8
IC613	B-8
IC614	C-10
IC615	B-9
IC616	E-10
IC617	F-13
IC618	F-11
Q611	E-1
Q612	E-2
Q613	D-3
Q614	B-10
Q615	B-11
Q616	B-11
Q618	D-1
Q619	D-2
Q620	E-14
Q621	E-6
Q624	C-2
Q625	C-1
Q626	C-3
Q627	B-1
Q628	B-2
Q629	B-2
Q630	D-3
Q631	E-13
Q632	F-13
Q633	A-9
Q634	B-7
Q635	E14
Q636	E-4
Q637	F-7
Q638	F-9
Q639	F-7
Q640	E-7
Q641	E-6
W611	F-21
W612	F-19

VC-32P BOARD (COMPONENT SIDE)


A
B
C
D
E
F
1
2
3
4
5
6
7
8
9
10
11
CHASSIS
TEST
IC611
IC612
IC613
IC615
IC616
IC618
Q633
Q634
Q638
22

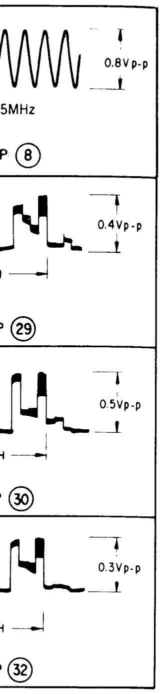
IC601
Q601
TP601 TP602
W601

VC-32P BOARD (CONDUCTOR SIDE)


CP-70P BOARD
IC617
Q620
Q635
D620
12
13
14
15

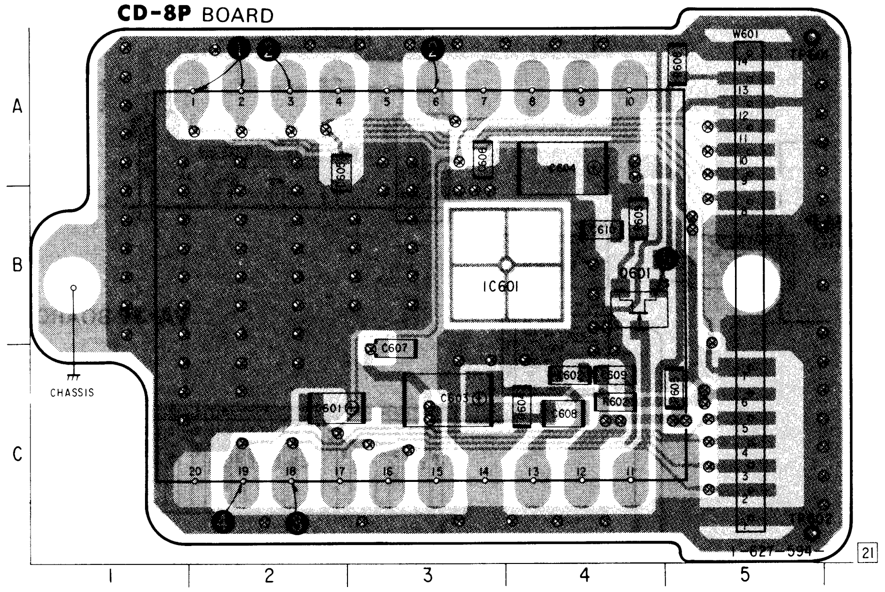
CD IMAGER) PRINTED WIRING BOARDS

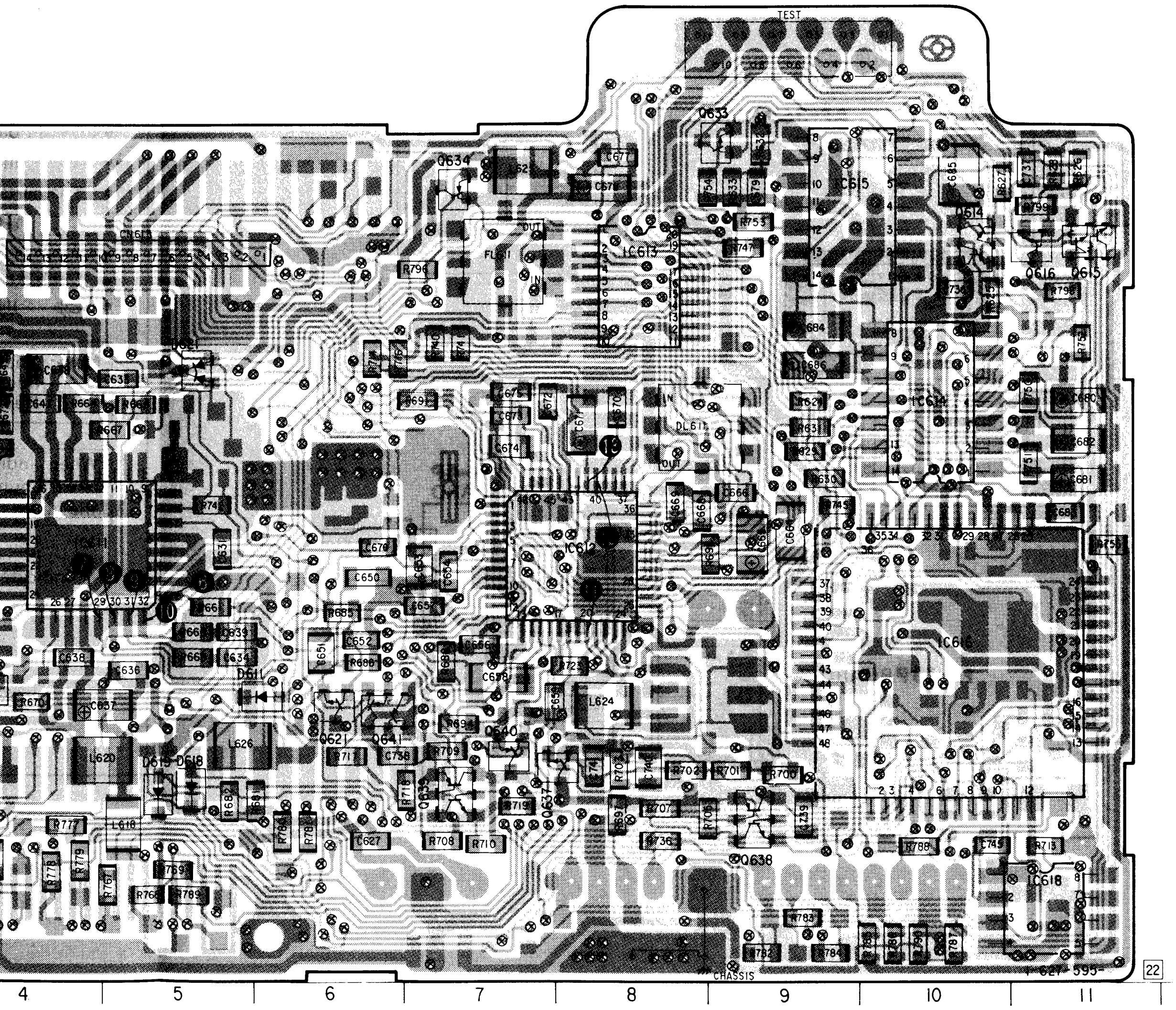
BOARD : 4,000 series—



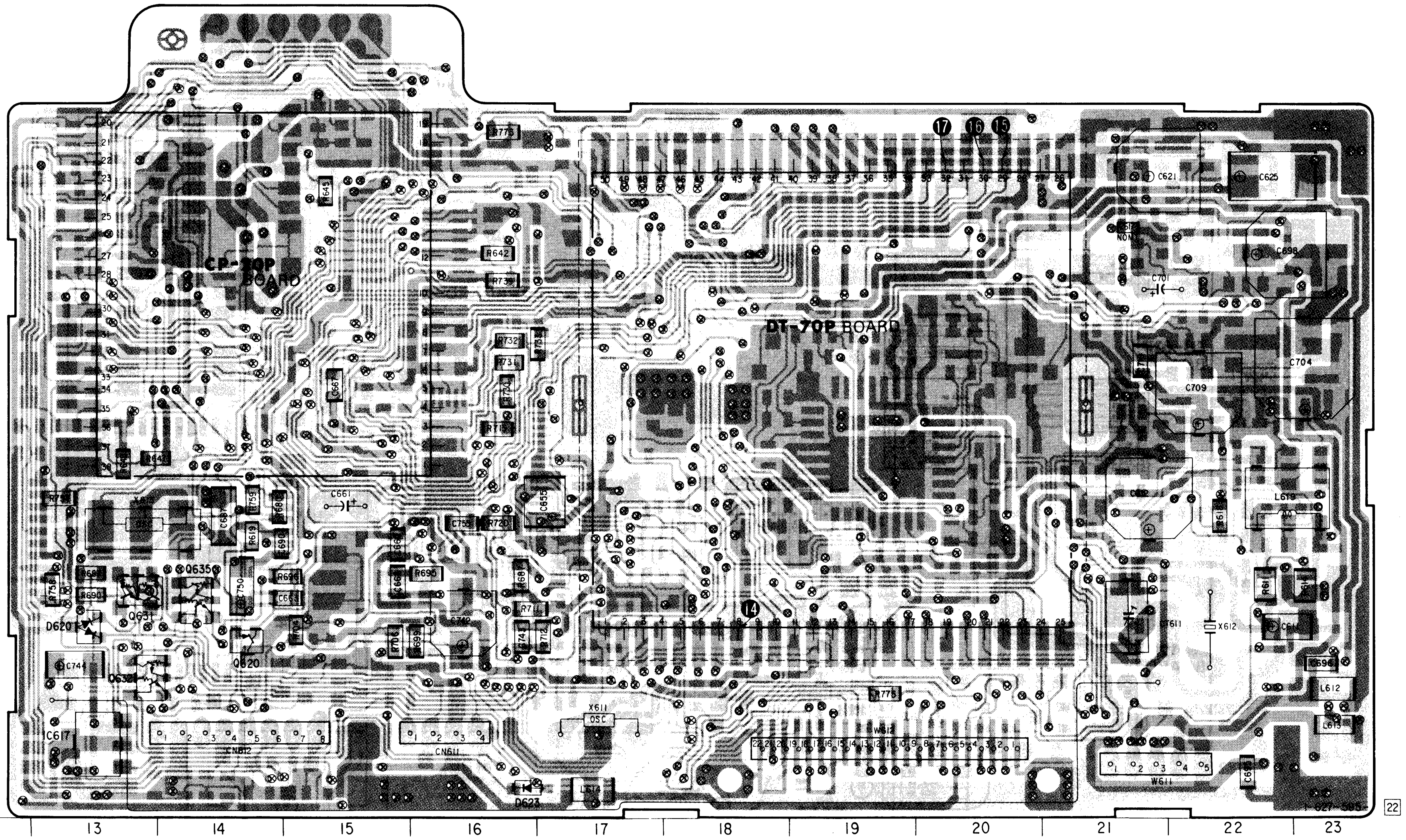
CD-8P BOARD

IC601	B-3
Q601	B-4
TP601	A-5
TP602	C-5
W601	A-5


A
B
C
1
2
3
4
5
IC601
Q601
W601
C607
CHASSIS
21

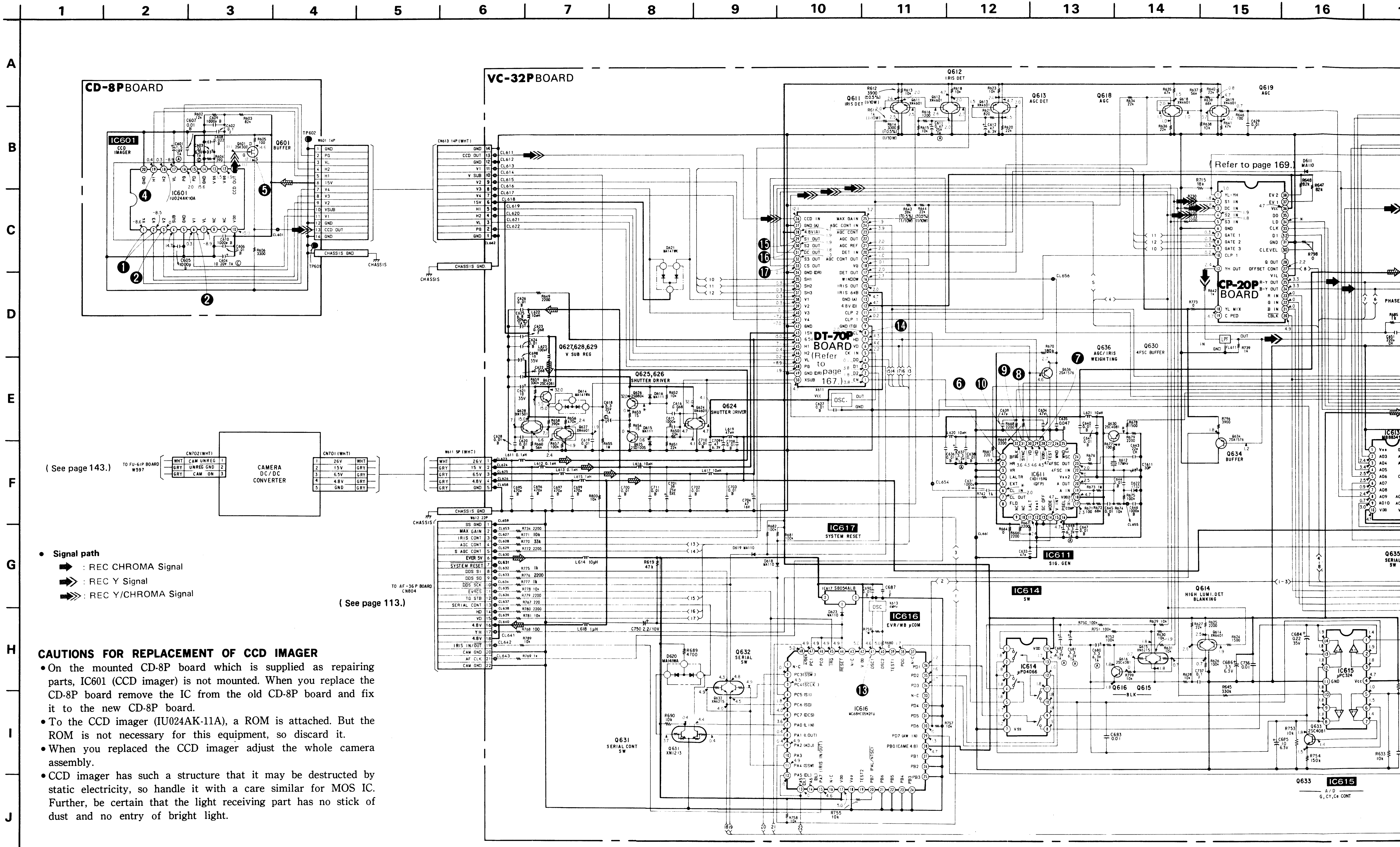

TEST
IC613
IC615
IC612
IC614
Q633
Q634
Q638
CHASSIS
22
4
5
6
7
8
9
10
11

VC-32P BOARD (CONDUCTOR SIDE)


CP-70P BOARD
DT-70P BOARD
CN612
CN611
X611
OSC
W612
W611
C621
C625
C701
C704
C709
X612
D620
D623
Q631
Q635
Q620
22
12
13
14
15
16
17
18
19
20
21
22
23

VC-32P (CAMERA PROCESS), CD-8P (CCD IMAGER) SCHEMATIC DIAGRAM

—Ref. No. VC-32P BOARD: 1,000 series, CD-8P BOARD: 4,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
CD-8P BOARD
IC601 CCD IMAGER
IC601 IU024AK-10A
Q601 BUFFER
VC-32P BOARD
Q611 IRIS DET
Q612 IRIS DET
Q613 AGC DET
Q618 AGC
Q619 AGC
(Refer to page 169.)
CP-20P BOARD
DT-70P BOARD (Refer to page 167.)
Q627,628,629 V SUB REG
Q625,626 SHUTTER DRIVER
Q624 SHUTTER DRIVER
Q636 AGC/IRIS WEIGHTING
Q630 4FSC BUFFER
Q634 BUFFER
IC611 CXD1159Q SIG. GEN
IC617 SYSTEM RESET
IC614 SW
IC614 μPD4066
IC616 EVR/WB μCOM
IC616 MC68HC05N2FU
Q614 HIGH LUMI.DET BLANKING
Q616 Q615 BLK
IC615 μPC324 A/D G,CY,Ce CONT
Q633
Q632 SERIAL SW
Q631 SERIAL CONT SW
Q635 SERIAL SW
(See page 143.)
TO FU-61P BOARD W597
CN702 (WHT)
CAM UNREG
UNREG GND
CAM ON
CAMERA DC/DC CONVERTER
CN701 (WHT)
26V
15V
6.5V
4.8V
GND
TO AF-36P BOARD CN804
(See page 113.)
CHASSIS GND
CHASSIS

- **Signal path**

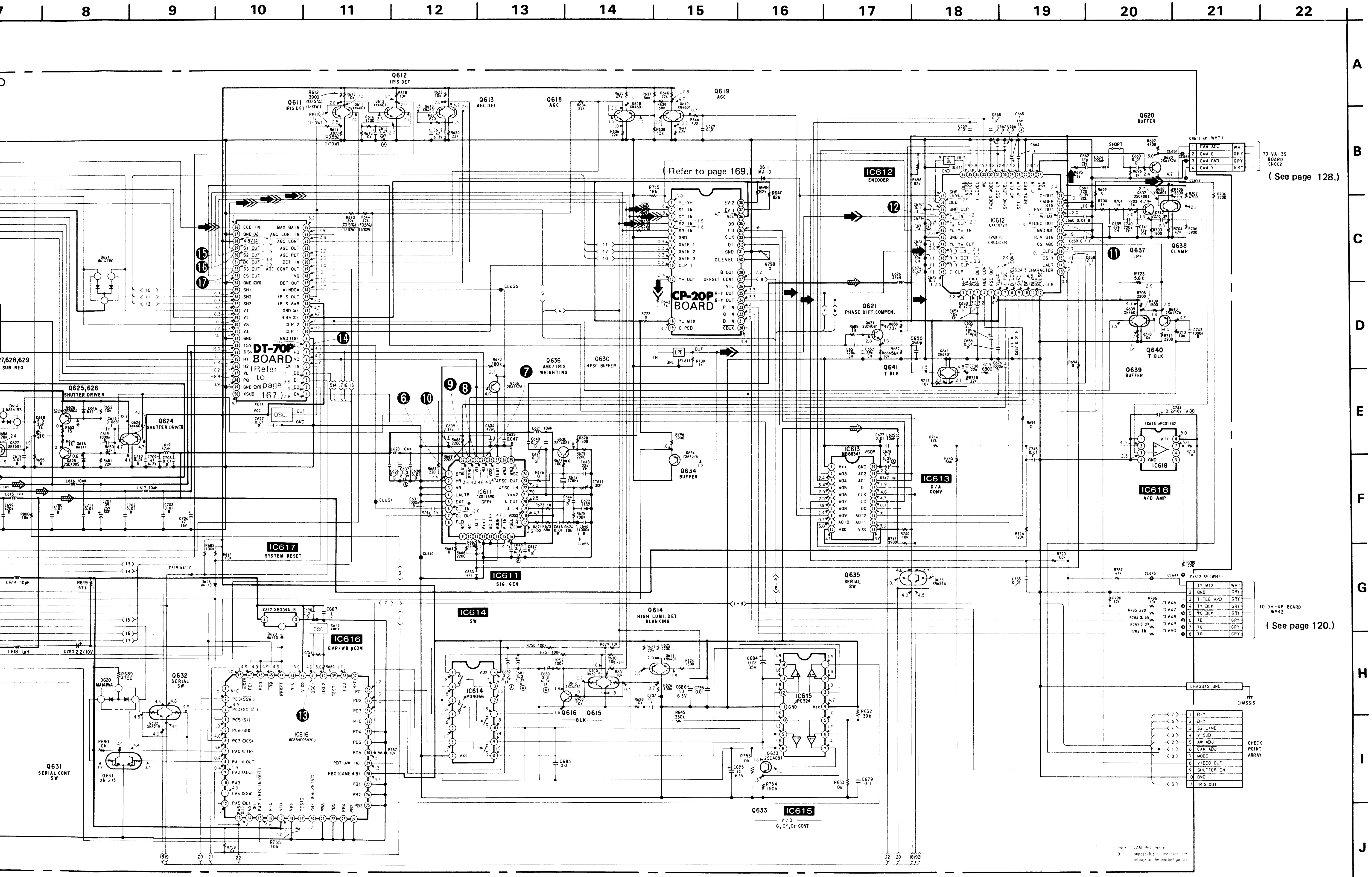
➡ : REC CHROMA Signal

⇒ : REC Y Signal

⇛ : REC Y/CHROMA Signal

CAUTIONS FOR REPLACEMENT OF CCD IMAGER

- On the mounted CD-8P board which is supplied as repairing parts, IC601 (CCD imager) is not mounted. When you replace the CD-8P board remove the IC from the old CD-8P board and fix it to the new CD-8P board.
- To the CCD imager (IU024AK-11A), a ROM is attached. But the ROM is not necessary for this equipment, so discard it.
- When you replaced the CCD imager adjust the whole camera assembly.
- CCD imager has such a structure that it may be destructed by static electricity, so handle it with a care similar for MOS IC. Further, be certain that the light receiving part has no stick of dust and no entry of bright light.


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J
Q611 IRIS DET
Q612 IRIS DET
Q613 AGC DET
Q618 AGC
Q619 AGC
Q620 BUFFER
DT-70P BOARD (Refer to page 167.)
CP-20P BOARD
(Refer to page 169.)
IC612 ENCODER
IC612 CXA1072R (VQFP) ENCODER
Q637 LPF
Q638 CLAMP
Q621 PHASE DIFF COMPEN.
Q641 T BLK
Q640 T BLK
Q639 BUFFER
Q636 AGC/IRIS WEIGHTING
Q630 4FSC BUFFER
Q634 BUFFER
IC611 CXD1159Q (QFP)
IC611 SIG. GEN
IC613 MB88341
IC613 D/A CONV
IC618 μPC311G2
IC618 A/D AMP
Q625,626 SHUTTER DRIVER
Q624 SHUTTER DRIVER
27,628,629 SUB REG
IC617 SYSTEM RESET
IC617 S8054ALB
IC616 EVR/WB μCOM
IC616 MC68HC05N2FU
Q632 SERIAL SW
Q631 SERIAL CONT SW
IC614 SW
IC614 μPD4066
Q614 HIGH LUMI.DET BLANKING
Q616 Q615 BLK
IC615 μPC324
Q633 IC615 A/D G,CY,Ce CONT
Q635 SERIAL SW
CN611 4P (WHT)
1 CAM ADJ WHT
2 CAM C GRY
3 CAM GND GRY
4 CAM Y GRY
TO VA-39 BOARD CN002
(See page 128.)
CN612 8P (WHT)
1 TY MIX WHT
2 GND GRY
3 TITLE A/D GRY
4 TY BLK GRY
5 TC BLK GRY
6 TB GRY
7 TG GRY
8 TR GRY
TO DH-4P BOARD W942
(See page 120.)
CHASSIS GND
CHASSIS
1 R-Y
2 B-Y
3 S2 LINE
4 V SUB
5 AW ADJ
6 CAM ADJ
7 MODE
8 VIDEO OUT
9 SHUTTER EN
10 GND
11 IRIS OUT
CHECK POINT ARRAY
SHORT
OSC
LPF

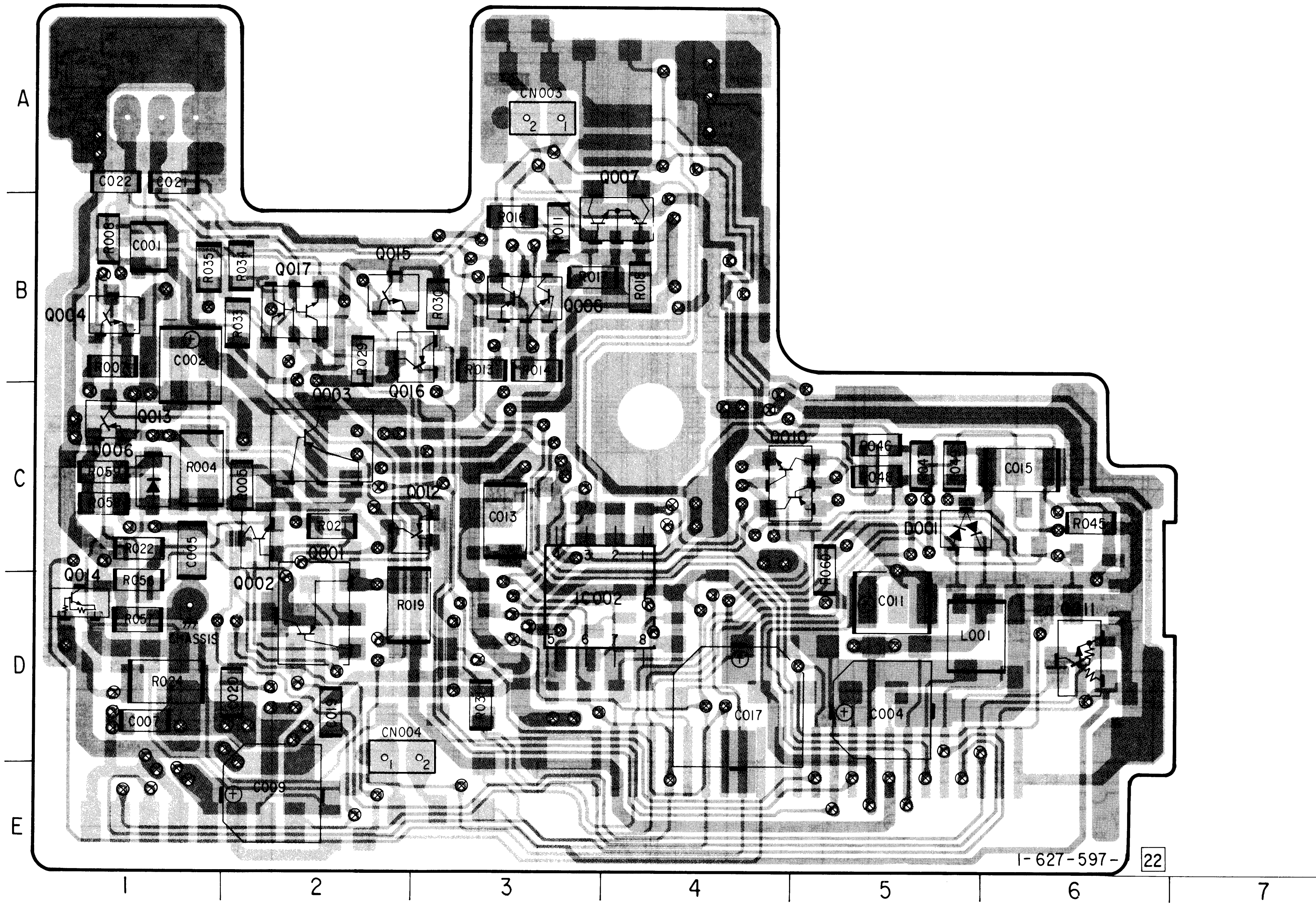
mark : CAM REC mode
* : impossible to measure the voltage at the marked points

DM-21P (ZOOM MOTOR/FOCUS MOTOR/IRIS METER DRIVER) PRINTED WIRING BOARD

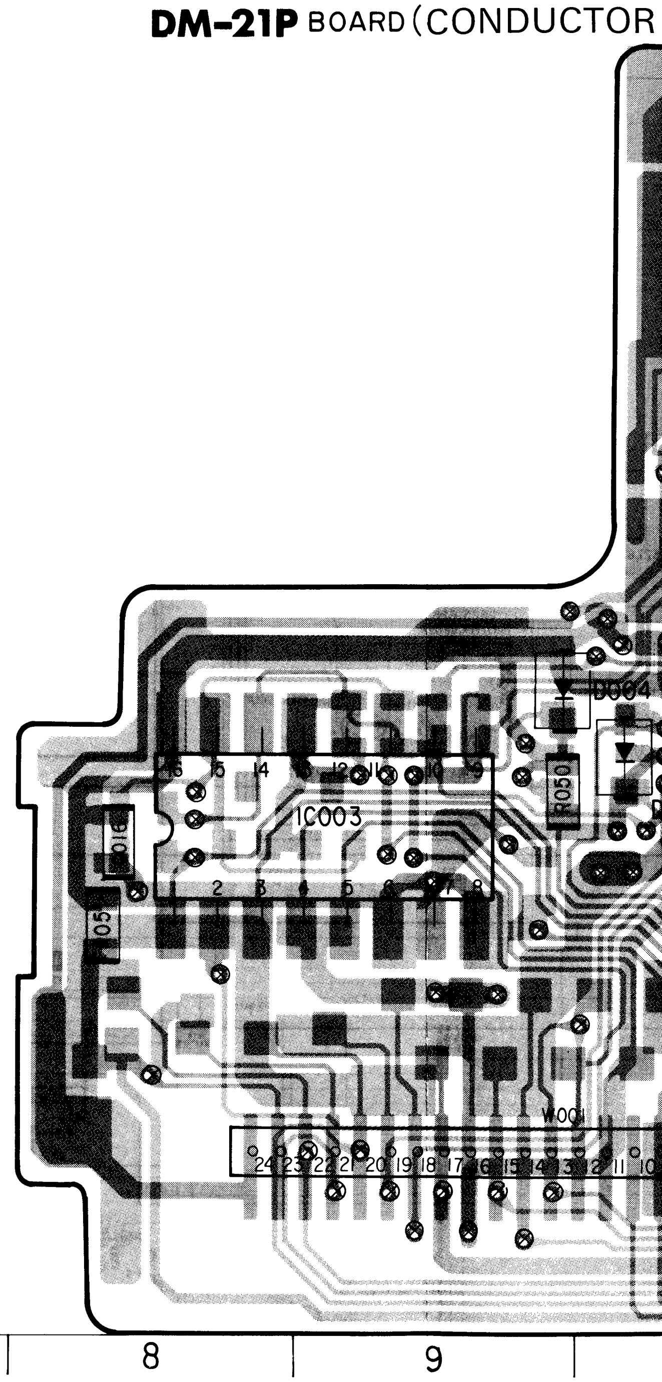
—Ref. No. DM-21P BOARD: 4,000 series—

CN001	A-13
CN002	A-10
CN003	A-3
CN004	E-2
D001	C-5
D003	C-10
D004	C-10
D005	D-12
D006	C-1
D007	C-11
IC001	C-13
IC002	D-3
IC003	C-9
IC004	D-13
Q001	D-2
Q002	C-2
Q003	C-2
Q004	B-1
Q005	B-11
Q006	B-3
Q007	B-4
Q008	D-10
Q009	B-12
Q010	D-4
Q011	D-6
Q012	C-3
Q013	C-1
Q014	D-1
Q015	B-2
Q016	B-2
Q017	B-2
RV001	B-11
W001	D-10

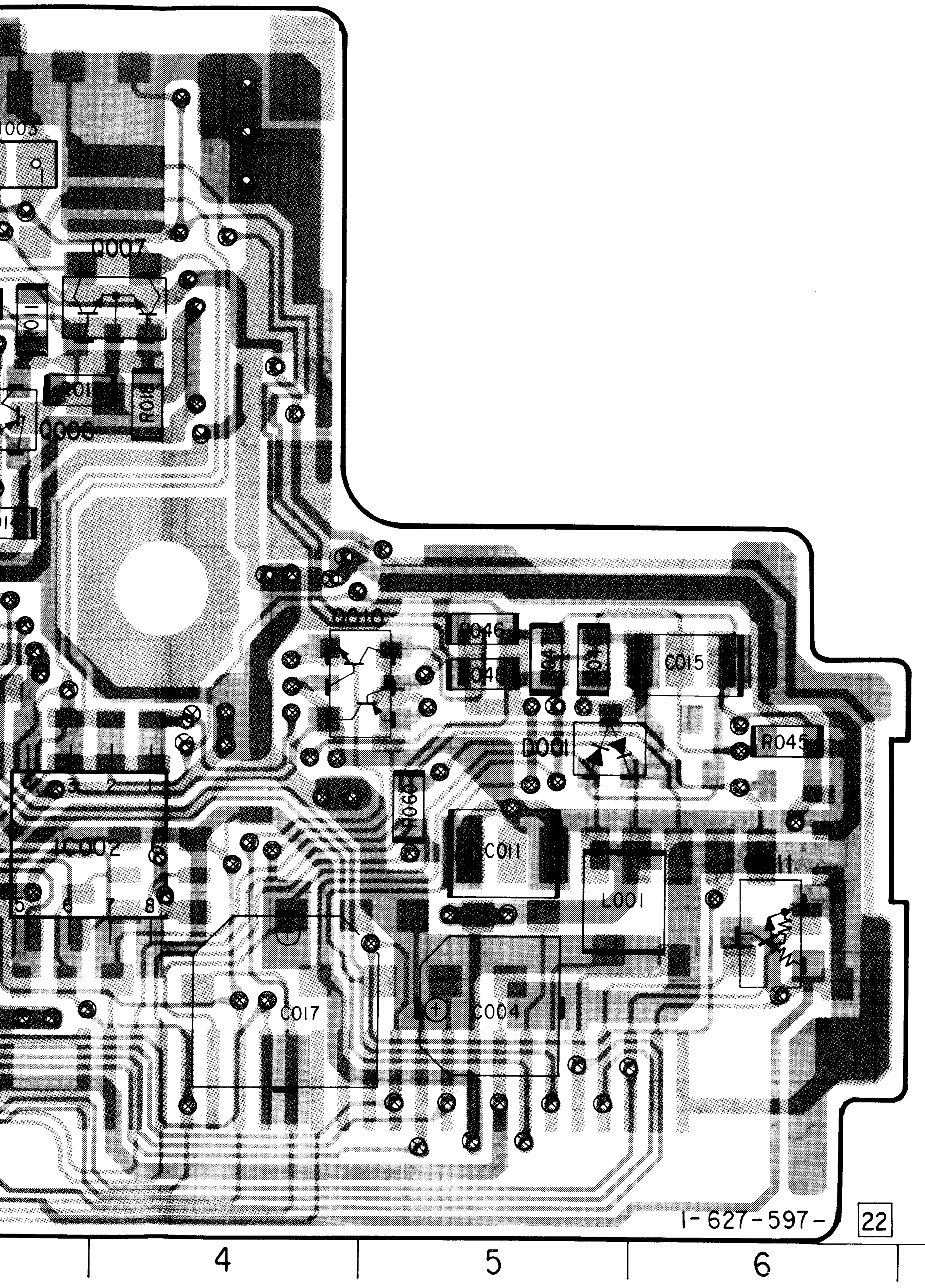
DM-21P BOARD (COMPONENT SIDE)


A
B
C
D
E
CN003
C022
C021
Q007
R016
R011
R006
C001
R035
R034
Q017
Q015
R030
R010
R018
Q006
Q004
R033
C002
R028
R013
R014
R008
Q003
Q016
Q013
D006
R004
R053
R052
R005
Q010
C046
C040
R044
R041
C015
Q012
C013
R021
Q001
R045
D001
R022
C005
IC002
R060
Q014
R051
Q002
R019
C011
L001
R050
CHASSIS
Q011
R034
R020
R015
R031
C017
C004
C007
CN004
C009
1-627-597-22
1
2
3
4
5
6
7

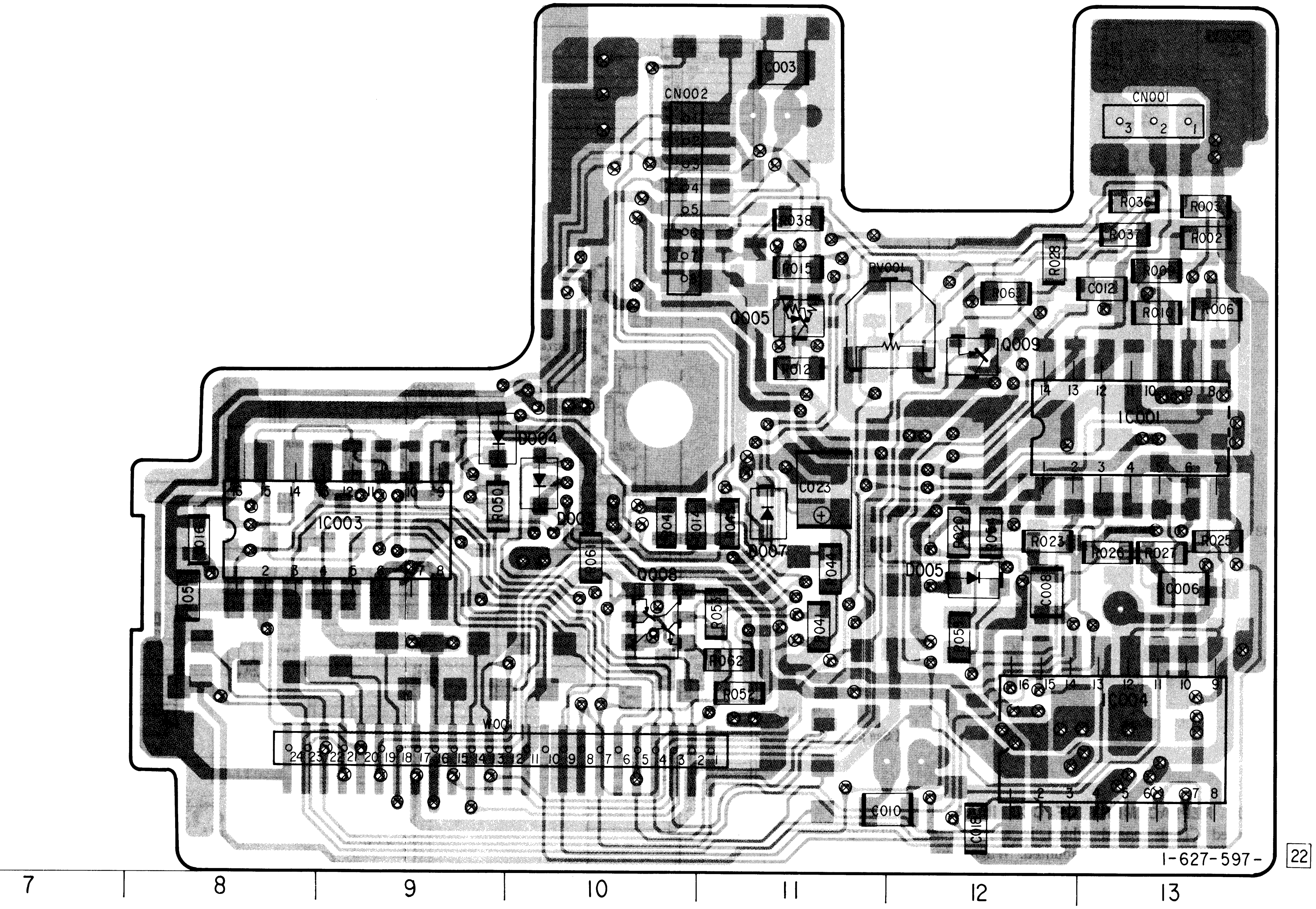
DM-21P BOARD (CONDUCTOR


D004
IC003
R050
R016
W001
8
9

ER) PRINTED WIRING BOARD

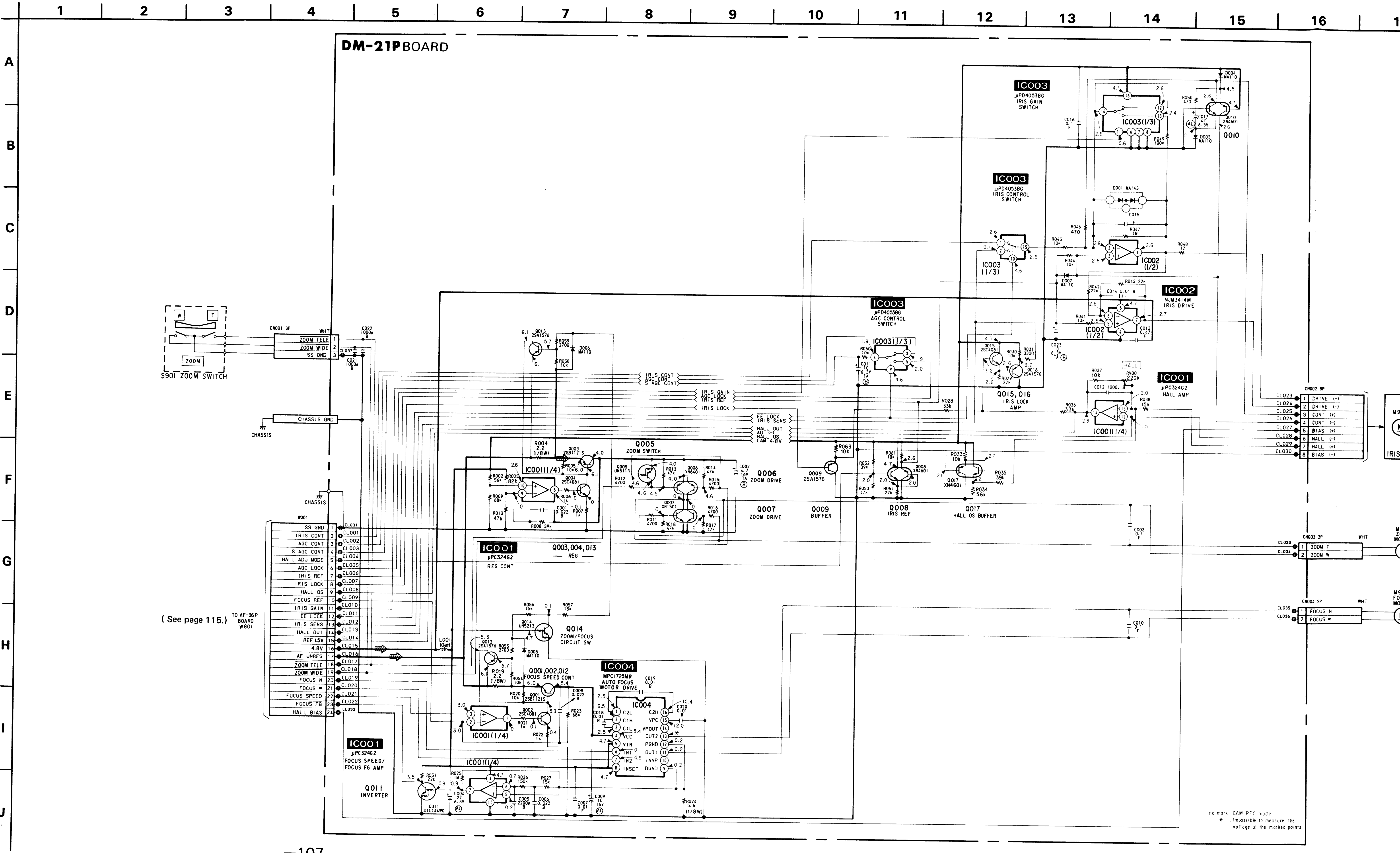

Q007
Q006
Q010
C046
C015
D001
R045
IC002
C011
L001
C017
C004
1-627-597- 22
4
5
6

DM-21P BOARD (CONDUCTOR SIDE)

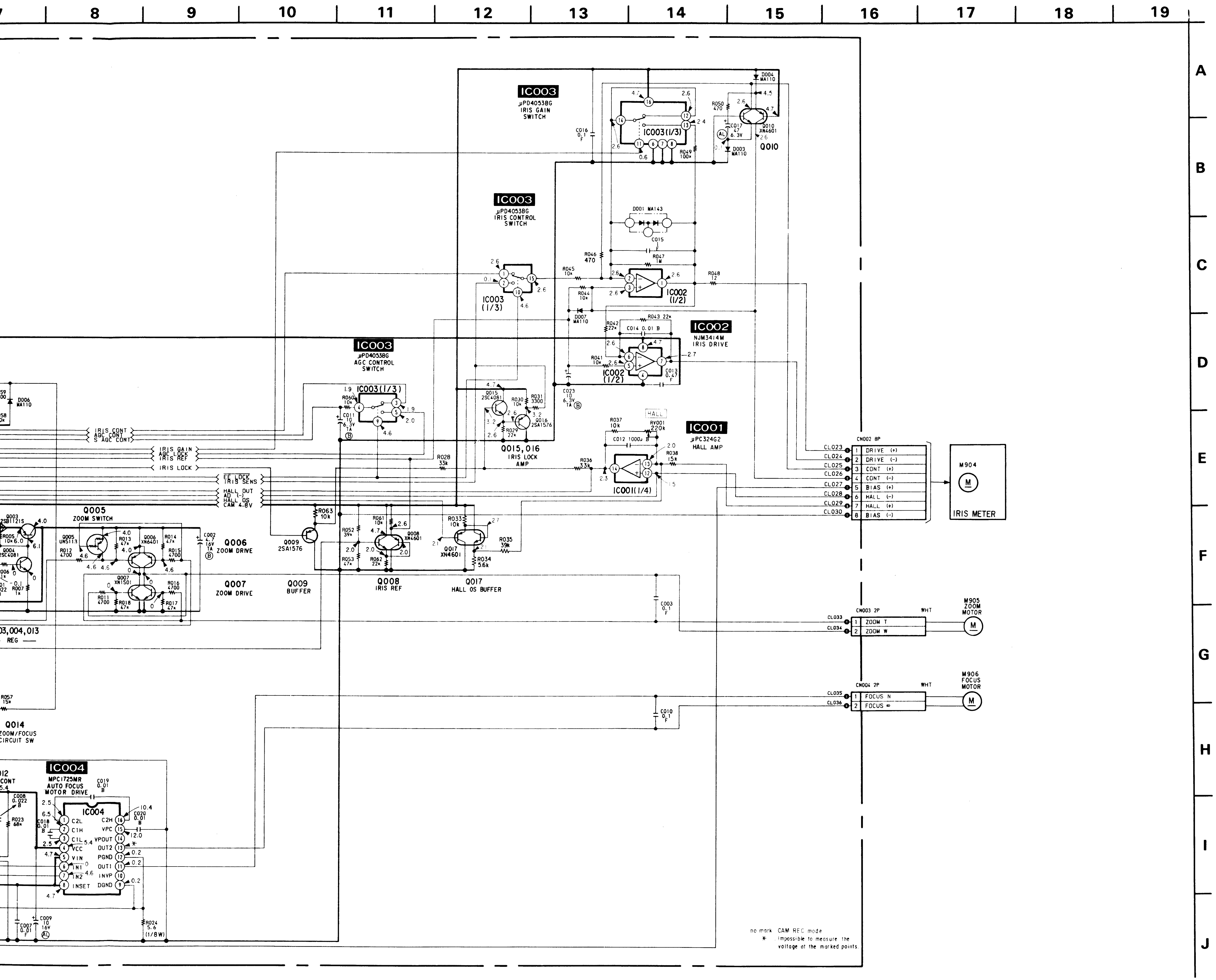

CN002
C003
CN001
R036
R003
R037
R002
R038
R015
RV001
R028
R063
C012
R016
R006
Q005
Q009
IC001
D004
IC003
R050
C023
D007
D005
R023
R026
R027
R025
C008
C006
Q008
R052
W001
IC004
C010
C018
1-627-597- 22
7
8
9
10
11
12
13

DM-21P (ZOOM MOTOR/FOCUS MOTOR/IRIS METER DRIVER) SCHEMATIC DIAGRAM

—Ref. No. DM-21P BOARD: 4,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
DM-21P BOARD
IC003
μPD4053BG
IRIS GAIN SWITCH
IC003(1/3)
Q010
D004 MA110
D003 MA110
Q010 XN4601
IC003
μPD4053BG
IRIS CONTROL SWITCH
D001 MA143
C015
R047 1M
R046 470
IC003 (1/3)
IC002 (1/2)
IC002
NJM3414M
IRIS DRIVE
D007 MA110
IC003
μPD4053BG
AGC CONTROL SWITCH
IC003(1/3)
Q015,016
IRIS LOCK AMP
IC001
μPC324G2
HALL AMP
IC001(1/4)
HALL
RV001 220k
W T
ZOOM
S901 ZOOM SWITCH
CN001 3P
ZOOM TELE
ZOOM WIDE
SS GND
CHASSIS GND
CHASSIS
Q013 2SA1576
D006 MA110
IRIS CONT
AGC CONT
S AGC CONT
IRIS GAIN
AGC LOCK
IRIS REF
IRIS LOCK
EE LOCK
IRIS SENS
HALL OUT
AD (-)
HALL OS
CAM 4.8V
Q005
ZOOM SWITCH
Q005 UN5113
Q006 XN6401
Q006
ZOOM DRIVE
Q007 XN1501
Q007
ZOOM DRIVE
Q003 2SB1121S
Q004 2SC4081
IC001(1/4)
Q009 2SA1576
Q009
BUFFER
Q008 XN4601
Q008
IRIS REF
Q017 XN4601
Q017
HALL OS BUFFER
IC001
μPC324G2
REG CONT
Q003,004,013
— REG —
W001
SS GND
IRIS CONT
AGC CONT
S AGC CONT
HALL ADJ MODE
AGC LOCK
IRIS REF
IRIS LOCK
HALL OS
FOCUS REF
IRIS GAIN
EE LOCK
IRIS SENS
HALL OUT
REF 1.5V
4.8V
AF UNREG
ZOOM TELE
ZOOM WIDE
FOCUS N
FOCUS ∞
FOCUS SPEED
FOCUS FG
HALL BIAS
(See page 115.)
TO AF-36P BOARD W801
Q014 UN5213
Q014
ZOOM/FOCUS CIRCUIT SW
Q012 2SA1576
D005 MA110
Q001,002,012
FOCUS SPEED CONT
Q001 2SB1121S
Q002 2SC4081
IC001(1/4)
L001 10μH
IC004
MPC1725MR
AUTO FOCUS MOTOR DRIVE
IC004
C2L
C1H
C1L
VCC
VIN
IN1
IN2
INSET
C2H
VPC
VPOUT
OUT2
PGND
OUT1
INVP
DGND
IC001
μPC324G2
FOCUS SPEED/ FOCUS FG AMP
Q011
INVERTER
Q011 DTC144EK
IC001(1/4)
CN002 8P
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
IRIS
CN003 2P
WHT
ZOOM T
ZOOM W
CN004 2P
WHT
FOCUS N
FOCUS ∞

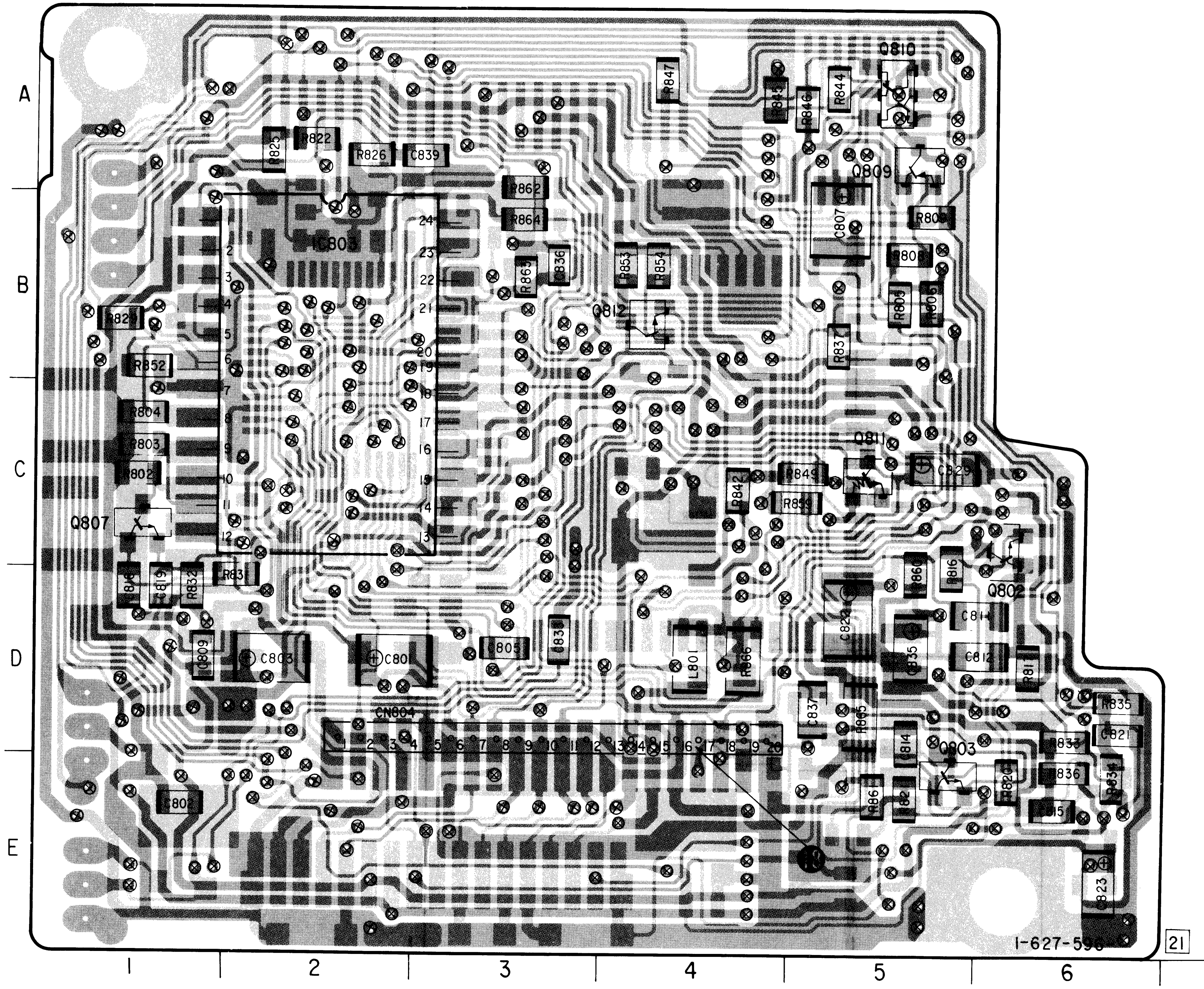
no mark : CAM REC mode
* : Impossible to measure the voltage at the marked points.


8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
IC003
μPD4053BG
IRIS GAIN SWITCH
IC003(1/3)
Q010
XN4601
D004 MA110
D003 MA110
IC003
μPD4053BG
IRIS CONTROL SWITCH
IC003 (1/3)
D001 MA143
IC002 (1/2)
IC002
NJM3414M
IRIS DRIVE
IC002 (1/2)
IC003
μPD4053BG
AGC CONTROL SWITCH
IC003(1/3)
Q015,016
IRIS LOCK AMP
IC001
μPC324G2
HALL AMP
IC001(1/4)
RV001 220k
HALL
IRIS CONT
AGC CONT
S AGC CONT
IRIS GAIN
AGC LOCK
IRIS REF
IRIS LOCK
EE LOCK
IRIS SENS
HALL OUT
AD (-)
HALL OS
CAM 4.8V
Q005
ZOOM SWITCH
Q006
ZOOM DRIVE
Q007
ZOOM DRIVE
Q009
2SA1576
BUFFER
Q008
XN4601
IRIS REF
Q017
XN4601
HALL OS BUFFER
3,004,013
REG
Q014
ZOOM/FOCUS
CIRCUIT SW
IC004
MPC1725MR
AUTO FOCUS
MOTOR DRIVE
C2L
C1H
C1L
VCC
VIN
IN1
IN2
INSET
C2H
VPC
VPOUT
OUT2
PGND
OUT1
INVP
DGND
CN002 8P
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
M904
IRIS METER
CN003 2P
ZOOM T
ZOOM W
M905
ZOOM MOTOR
CN004 2P
FOCUS N
FOCUS ∞
M906
FOCUS MOTOR
WHT

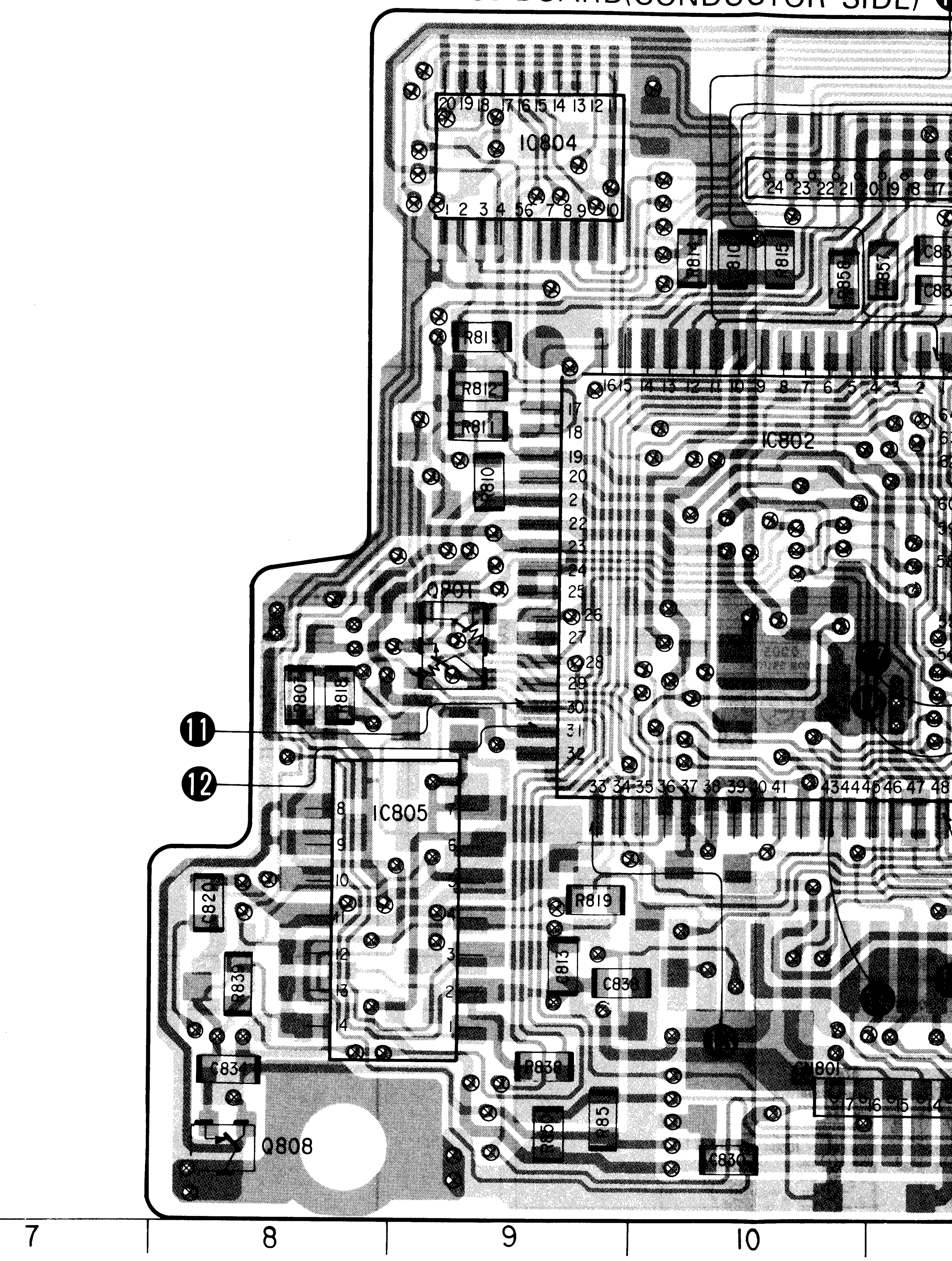
no mark CAM REC mode
* impossible to measure the voltage at the marked points.

AF-36P (AUTO FOCUS) PRINTED WIRING BOARD
—Ref. No. AF-36P BOARD: 4,000 series—

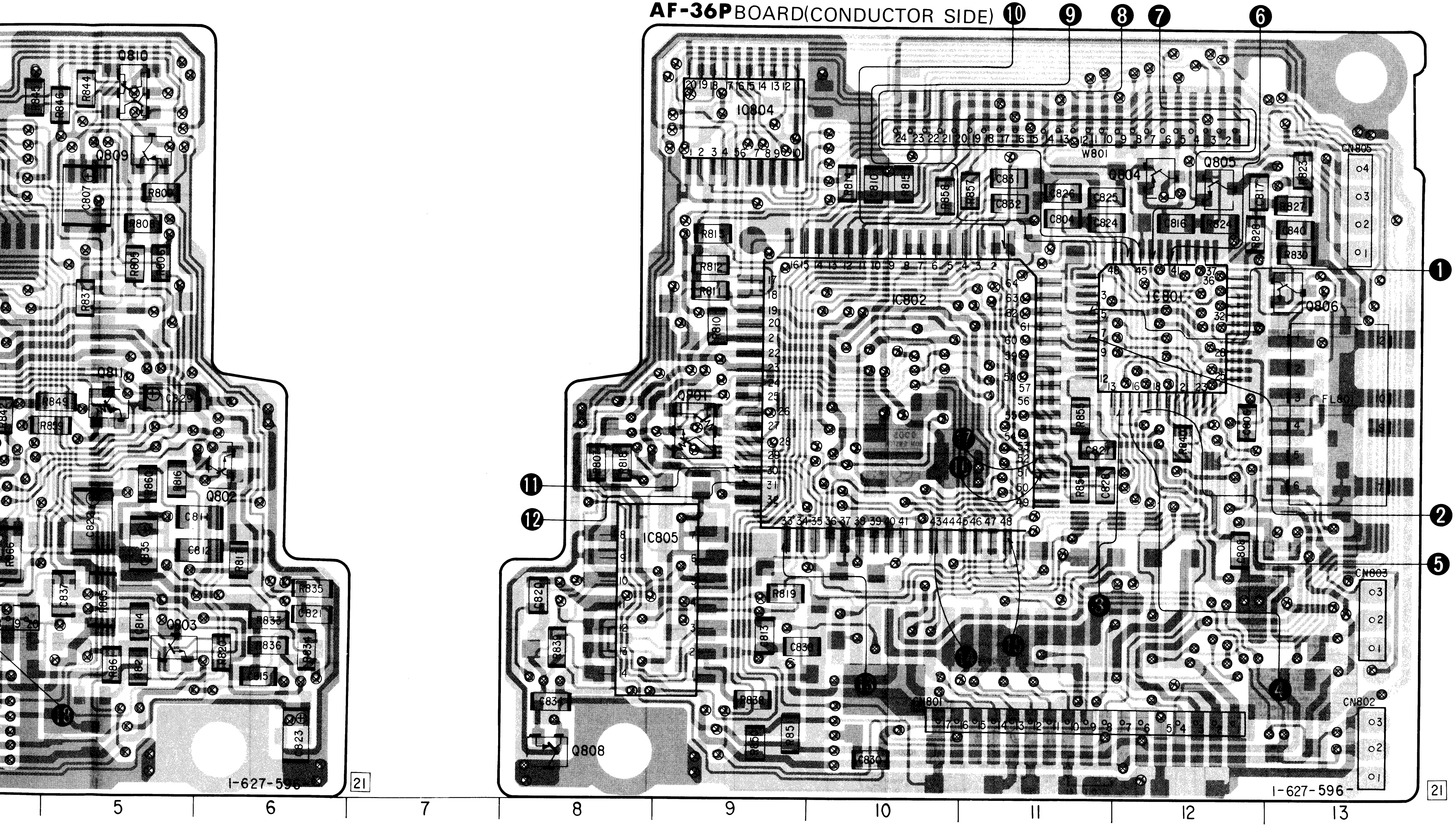
AF-36P BOARD (COMPONENT SIDE)


A
B
C
D
E
1
2
3
4
5
6
7
IC803
Q810
Q809
Q812
Q811
Q807
Q802
Q803
CN804
R847
R844
R846
R843
R825
R822
R826
C839
R862
R864
R863
C836
R853
R854
C807
R807
R808
R806
R805
R837
R828
R852
R804
R803
R802
R842
R849
R855
C829
R818
C819
R832
R831
R860
R816
C822
C814
C812
R835
R81
C809
C803
C801
C805
R838
L801
R866
C837
R865
R814
R834
C821
R833
R836
R824
R861
R82
C831
R815
C802
C823
1-627-596
21

AF-36P BOARD(CONDUCTOR SIDE)


IC804
IC802
IC805
Q801
Q808
⓫
⓬
R814
R810
R815
R856
R857
R813
R812
R811
R810
R801
R818
R819
R813
C830
C820
R839
C834
C836
C830
8
9
10

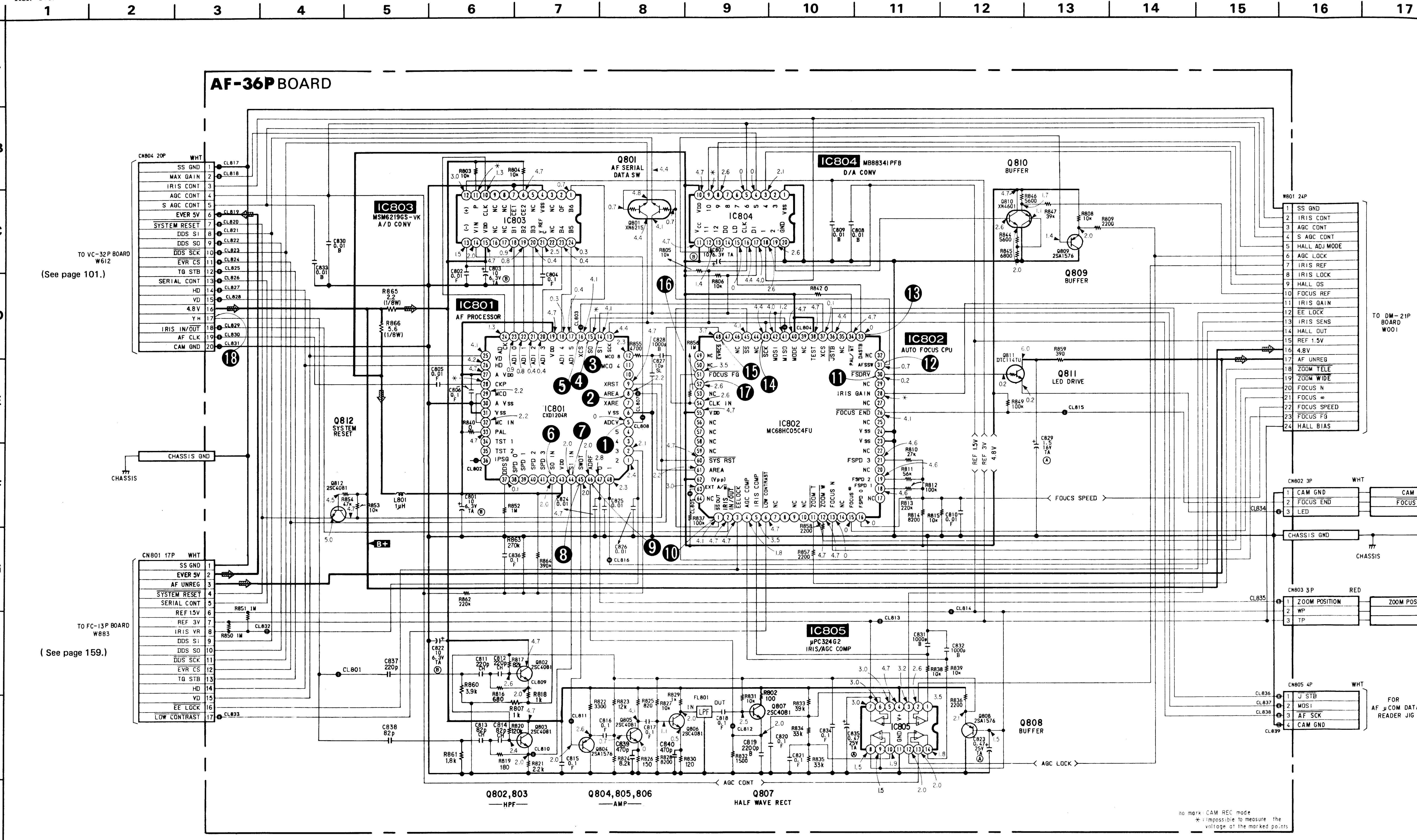
AF-36P BOARD (CONDUCTOR SIDE)


IC802
IC801
IC804
IC805
W801
FL801
CN801
CN802
CN803
CN805
Q801
Q802
Q803
Q804
Q805
Q806
Q808
Q809
Q810
Q811
1-627-596
21
1-627-596-
21
❶
❷
❸
❹
❺
❻
❼
❽
❾
❿
⓫
⓬
5
6
7
8
9
10
11
12
13

CN801	E-10
CN802	E-13
CN803	D-13
CN804	D-2
CN805	A-13
IC801	B-12
IC802	B-10
IC803	B-2
IC804	A-9
IC805	D-9
Q801	C-9
Q802	C-5
Q803	E-5
Q804	B-12
Q805	B-12
Q806	B-13
Q807	C-1
Q808	E-8
Q809	A-5
Q810	A-5
Q811	C-5
Q812	B-4
W801	A-11

AF-36P (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-36P BOARD: 4,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
AF-36P BOARD
CN804 20P WHT
SS GND
MAX GAIN
IRIS CONT
AGC CONT
S AGC CONT
EVER 5V
SYSTEM RESET
DDS SI
DDS SO
DDS SCK
EVR CS
TG STB
SERIAL CONT
HD
VD
4.8V
YH
IRIS IN/OUT
AF CLK
CAM GND
TO VC-32P BOARD W612
(See page 101.)
CHASSIS GND
CHASSIS
CN801 17P WHT
SS GND
EVER 5V
AF UNREG
SYSTEM RESET
SERIAL CONT
REF 15V
REF 3V
IRIS VR
DDS SI
DDS SO
DDS SCK
EVR CS
TG STB
HD
VD
EE LOCK
LOW CONTRAST
TO FC-13P BOARD W883
(See page 159.)
IC803
MSM6219GS-VK
A/D CONV
IC801
AF PROCESSOR
CXD1204R
Q801
AF SERIAL DATA SW
XN6215
IC804
MB88341PFB
D/A CONV
Q810
BUFFER
XN4601
Q809
BUFFER
2SA1576
IC802
AUTO FOCUS CPU
MC68HC05C4FU
Q811
LED DRIVE
DTC114TU
Q812
SYSTEM RESET
2SC4081
L801 1µH
B+
IC805
µPC324G2
IRIS/AGC COMP
Q802,803
—HPF—
Q804,805,806
—AMP—
Q807
HALF WAVE RECT
Q808
BUFFER
FL801
LPF
AGC CONT
AGC LOCK
FOUCS SPEED
W801 24P
SS GND
IRIS CONT
AGC CONT
S AGC CONT
HALL ADJ MODE
AGC LOCK
IRIS REF
IRIS LOCK
HALL OS
FOCUS REF
IRIS GAIN
EE LOCK
IRIS SENS
HALL OUT
REF 1.5V
4.8V
AF UNREG
ZOOM TELE
ZOOM WIDE
FOCUS N
FOCUS ∞
FOCUS SPEED
FOCUS FG
HALL BIAS
TO DM-21P BOARD W001
CN802 3P WHT
CAM GND
FOCUS END
LED
CHASSIS GND
CHASSIS
CN803 3P RED
ZOOM POSITION
WP
TP
CN805 4P WHT
J STB
MOSI
AF SCK
CAM GND
FOR AF µCOM DATA READER JIG
REF 1.5V
REF 3V
4.8V
1
2
3
4
5
6
7
8
9
10
11
12
13
14
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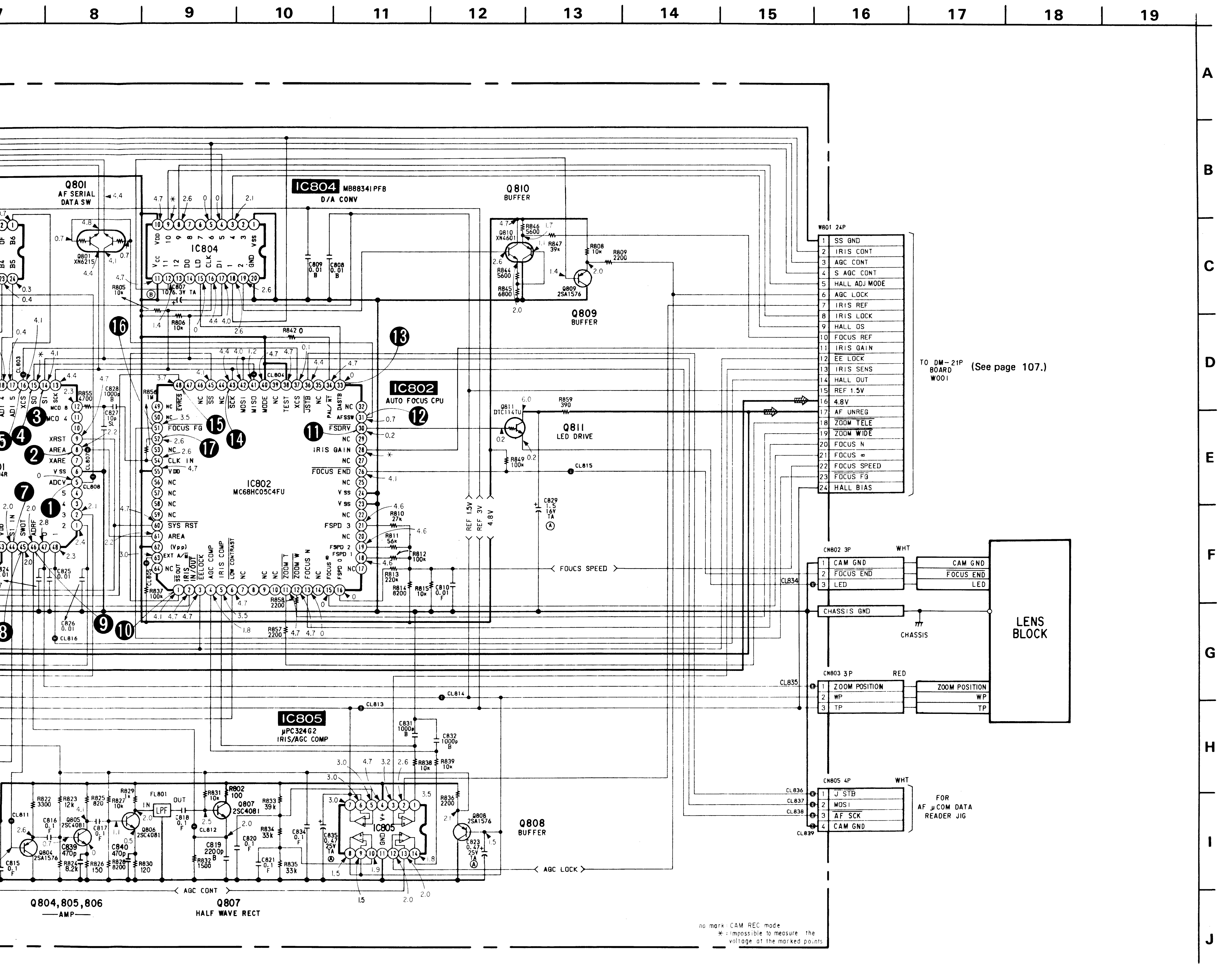
16
17
18

no mark: CAM REC mode
*: Impossible to measure the voltage at the marked points


7
8
9
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11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
Q801
AF SERIAL DATA SW
Q801 XN6215
IC804 MB88341PFB
D/A CONV
IC804
C807 10/6.3V TA
Q810
BUFFER
Q810 XN4601
R846 5600
R847 39k
R844 5600
R845 6800
Q809 2SA1576
Q809
BUFFER
R808 10k
R809 2200
W801 24P
1 SS GND
2 IRIS CONT
3 AGC CONT
4 S AGC CONT
5 HALL ADJ MODE
6 AGC LOCK
7 IRIS REF
8 IRIS LOCK
9 HALL OS
10 FOCUS REF
11 IRIS GAIN
12 EE LOCK
13 IRIS SENS
14 HALL OUT
15 REF 1.5V
16 4.8V
17 AF UNREG
18 ZOOM TELE
19 ZOOM WIDE
20 FOCUS N
21 FOCUS ∞
22 FOCUS SPEED
23 FOCUS FG
24 HALL BIAS
TO DM-21P BOARD W001
(See page 107.)
IC802
AUTO FOCUS CPU
IC802
MC68HC05C4FU
FOCUS FG
CLK IN
SYS RST
AREA
(Vpp)
EXT A/M
IRIS GAIN
FOCUS END
FSDRV
AFSSW
DASTB
FSPD 3
FSPD 2
FSPD 1
FSPD 0
ZOOM T
ZOOM W
FOCUS N
FOCUS ∞
EELOCK
AGC COMP
IRIS COMP
LOW CONTRAST
Q811 DTC114TU
Q811
LED DRIVE
R859 390
R849 100k
C829 1.5 16V TA
CL815
REF 1.5V
REF 3V
4.8V
FOUCS SPEED
CN802 3P WHT
1 CAM GND
2 FOCUS END
3 LED
CAM GND
FOCUS END
LED
CL834
CHASSIS GND
CHASSIS
LENS BLOCK
CN803 3P RED
1 ZOOM POSITION
2 WP
3 TP
ZOOM POSITION
WP
TP
CL835
CL814
CL813
IC805
μPC324G2
IRIS/AGC COMP
CN805 4P WHT
1 J STB
2 MOSI
3 AF SCK
4 CAM GND
CL836
CL837
CL838
CL839
FOR AF μCOM DATA READER JIG
Q808 2SA1576
Q808
BUFFER
AGC LOCK
AGC CONT
Q804,805,806
—AMP—
Q807
HALF WAVE RECT
Q807 2SC4081
Q806 2SC4081
Q805 2SC4081
Q804 2SA1576
FL801
LPF
CL811
CL812
CL816
CL808
R855 4700
R856 1M
R837 100k
R857 2200
R858 2200
R842 0
R805 10k
R806 10k
R810 27k
R811 56k
R812 100k
R813 220k
R814 8200
R815 10k
C810 0.01
C809 0.01
C808 0.01
C825 0.01
C826 0.01
C827 10p
C828 1000p
C831 1000p
C832 1000p
R838 10k
R839 10k
R836 2200
C823 0.47 25V TA
R822 3300
R823 12k
R825 820
R827 10k
R829 1k
R831 10k
R802 100
R833 39k
R834 33k
R835 33k
R832 1500
C819 2200p
C820 0.1
C821 0.1
C834 0.1
C835 0.47 25V TA
C816 0.1
C817 0.1
C818 0.1
C815 0.1
C839 470p
C840 470p
R824 8.2k
R826 150
R828 8200
R830 120
1
2
3
4
5
6
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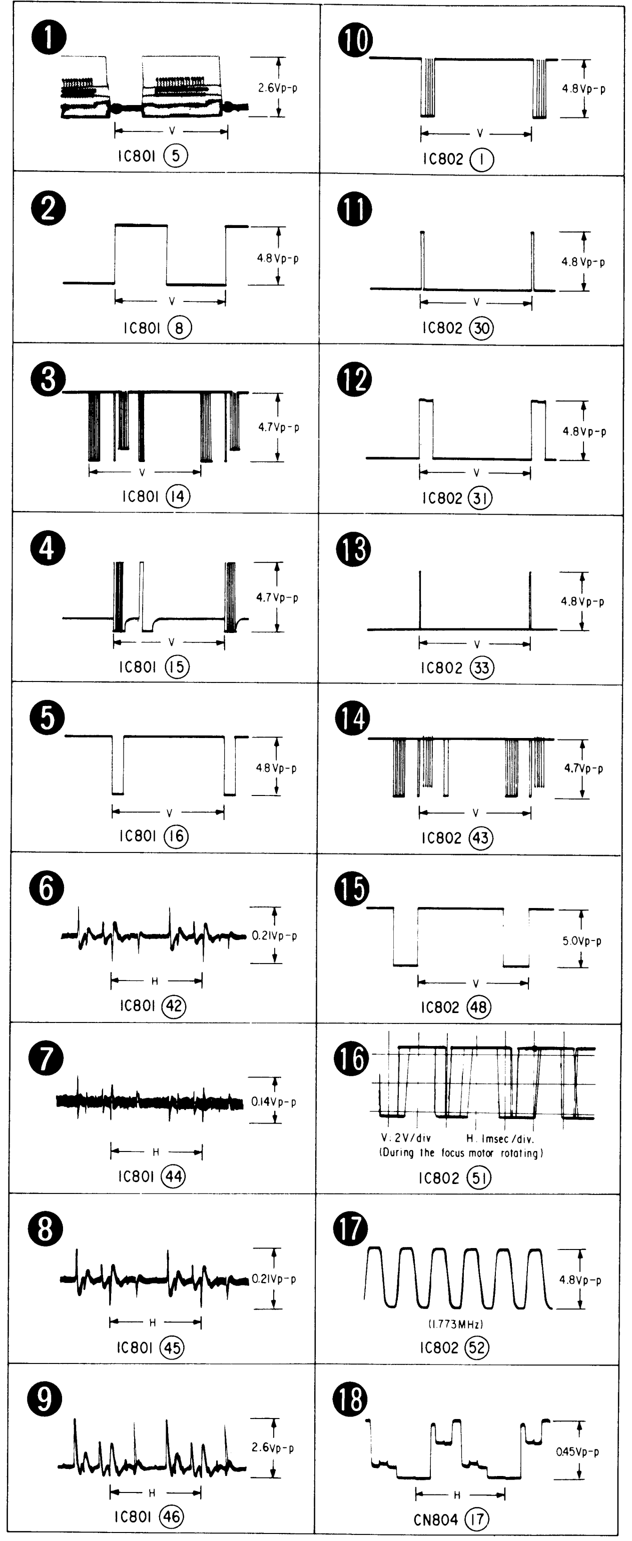
13
14
15
16
17

no mark : CAM REC mode
✱ : Impossible to measure the voltage at the marked points

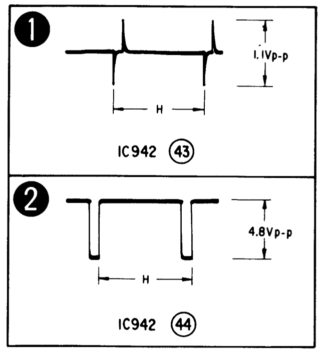
AF-36P BOARD



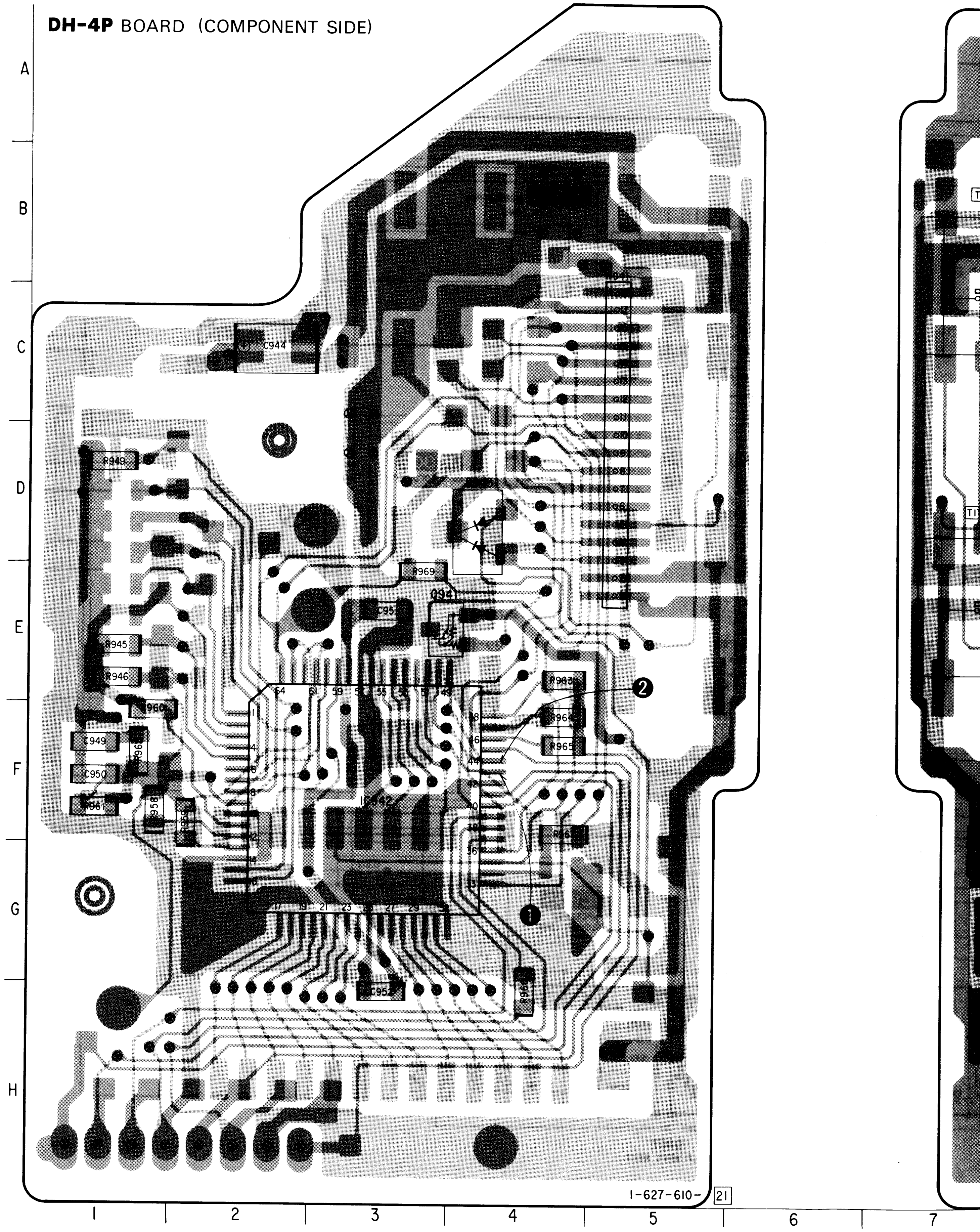
DH-4P (DIGITAL TITLER) PRINTED WIRING BOARD

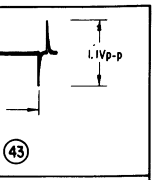
—Ref. No. DH-4P BOARD: 4,000 series—

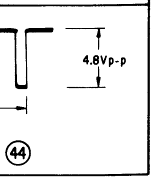
DH-4P BOARD



CT941	D-11
D941	F-12
D942	C-9
D943	D-4
IC941	G-9
IC942	F-3
Q941	E-4
W941	C-5
W942	H-11


DH-4P BOARD (COMPONENT SIDE)
A
B
C
D
E
F
G
H
C944
R949
R969
Q941
R945
R946
R960
C949
C950
R958
R959
IC942
R963
R964
R965
C952
❶
❷
1-627-610-
21
1
2
3
4
5
6
7

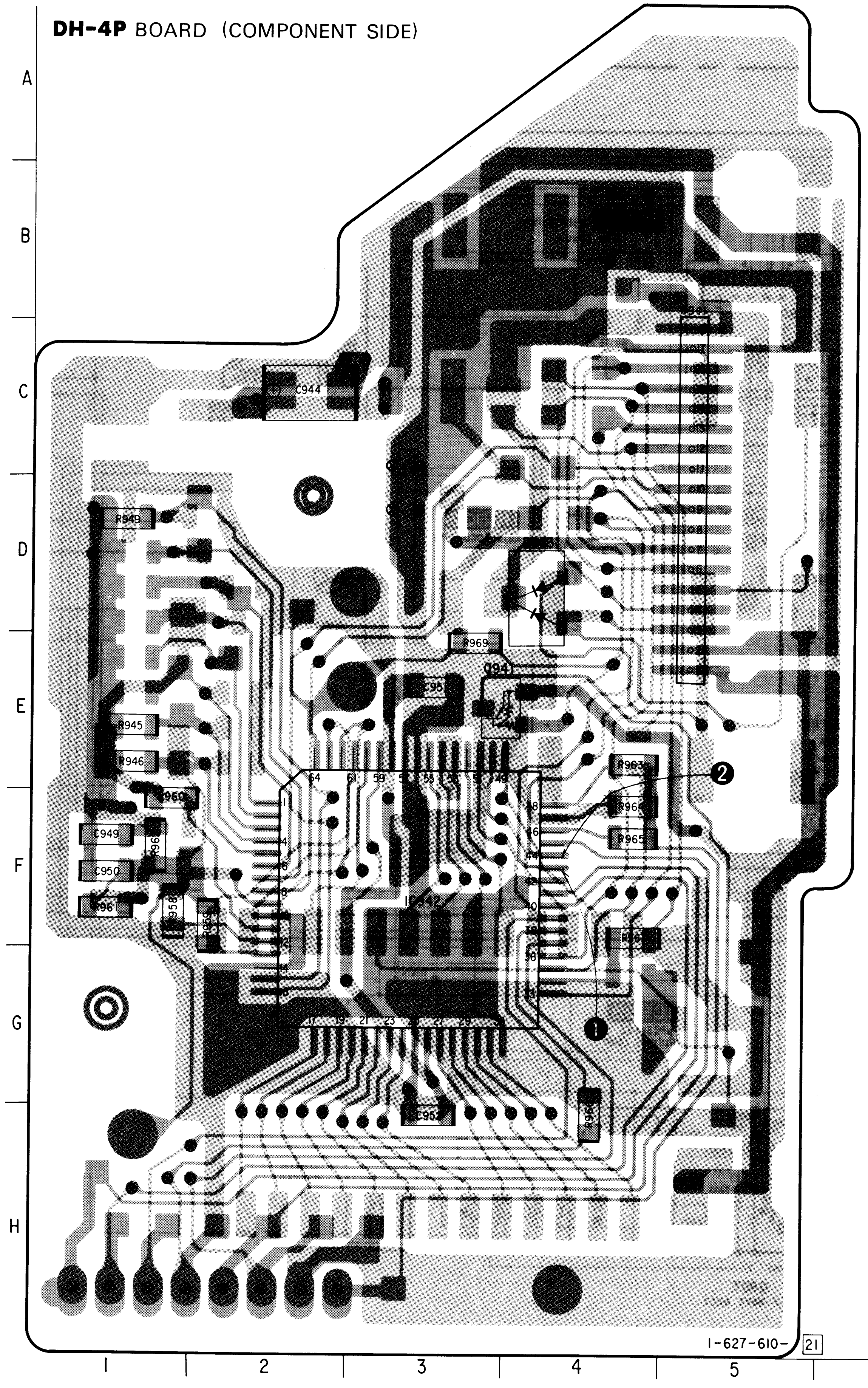


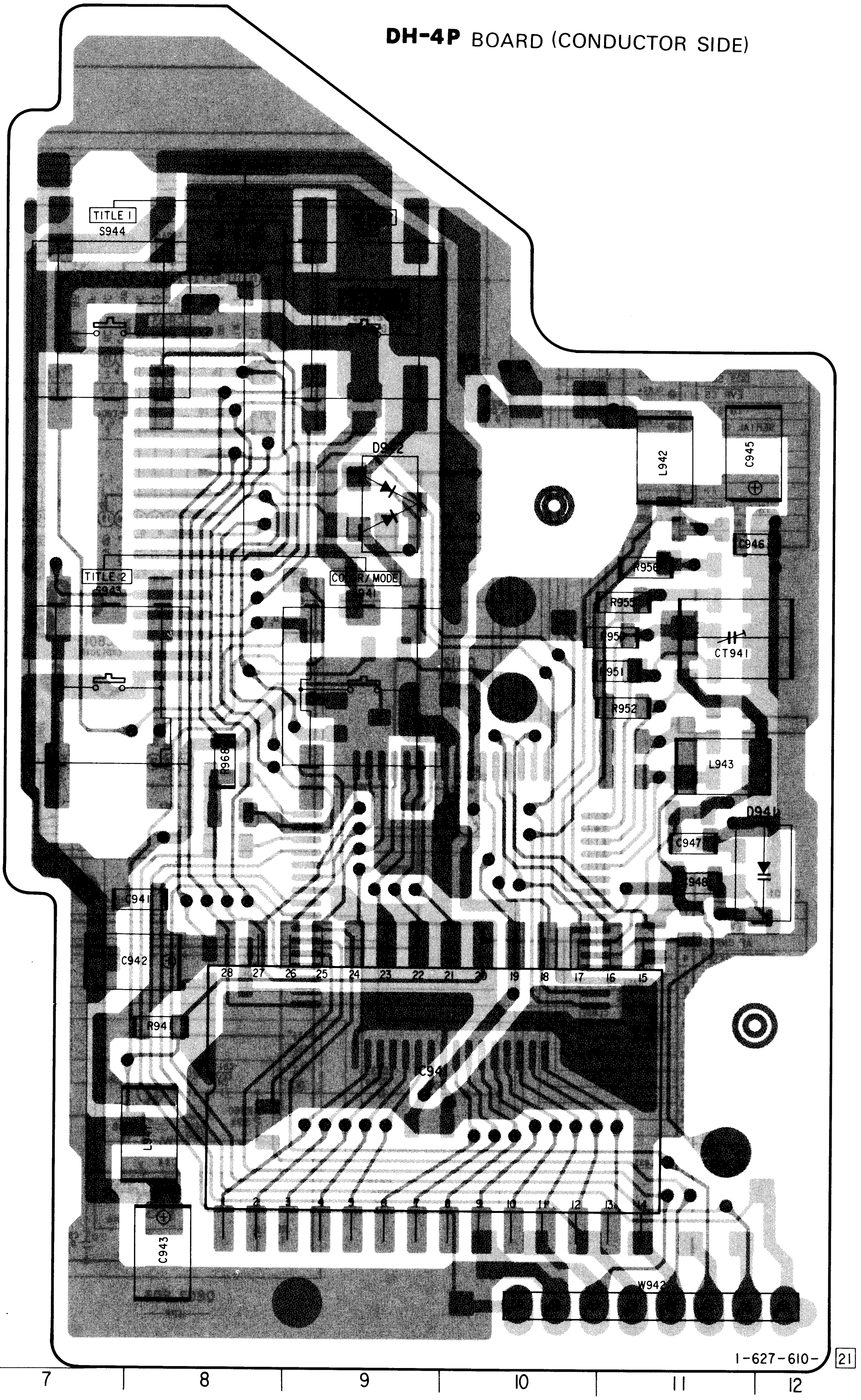


DH-4P (DIGITAL TITLER) PRINTED WIRING BOARD

—Ref. No. DH-4P BOARD: 4,000 series—

CT941	D-11
D941	F-12
D942	C-9
D943	D-4
IC941	G-9
IC942	F-3
Q941	E-4
W941	C-5
W942	H-11


DH-4P BOARD (COMPONENT SIDE)
A
B
C
D
E
F
G
H
C944
R949
R945
R946
R960
C949
C950
R961
R958
R959
R969
Q941
C951
R963
R964
R965
R962
R966
C952
IC942
64
61
59
57
55
53
51
49
48
46
44
42
40
38
36
33
17
19
21
23
25
27
29
1
4
6
8
12
14
16
❶
❷
1-627-610-
21
1
2
3
4
5


DH-4P BOARD (CONDUCTOR SIDE)
TITLE 1
S944
TITLE 2
S943
D942
COLOR/MODE
S941
L942
C945
C946
R956
R955
R954
CT941
R951
R952
R968
L943
D941
C947
C948
IC941
C942
R947
C941
L941
C943
W942
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1-627-610-
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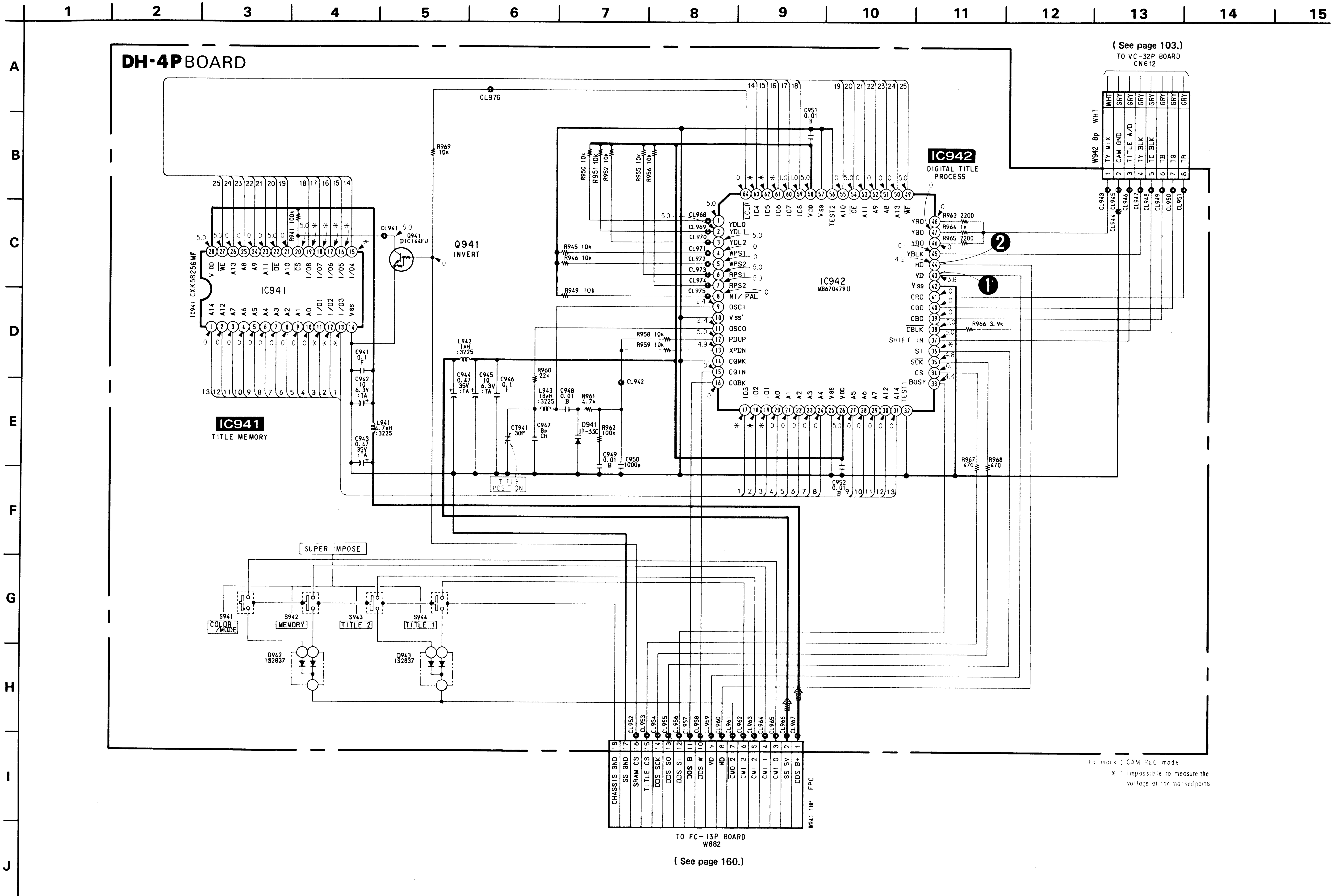
DH-4P (DIGITAL TITLER) SCHEMATIC DIAGRAM

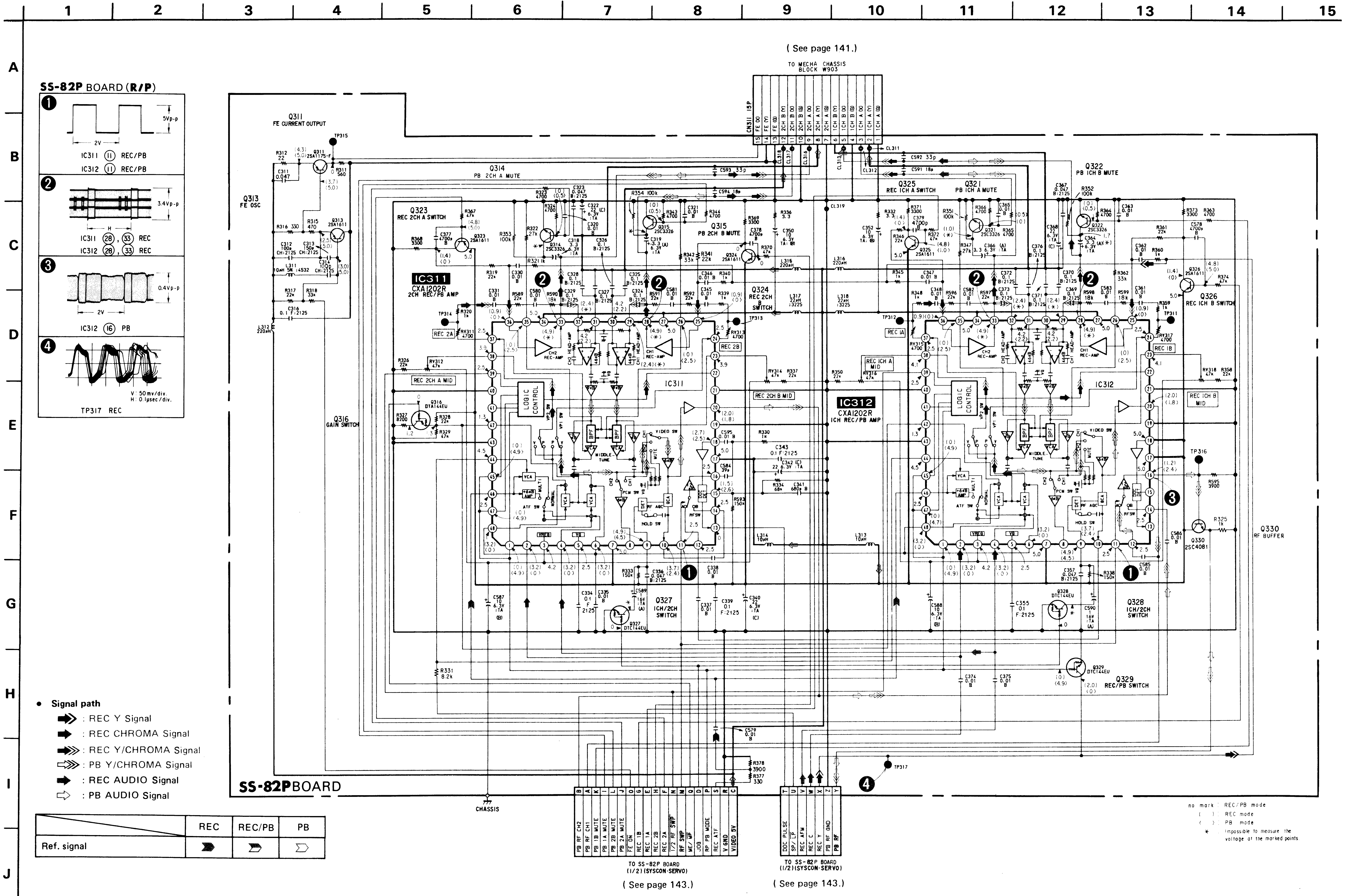
—Ref. No. DH-4P BOARD: 4,000 series—


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
DH-4P BOARD
(See page 103.)
TO VC-32P BOARD CN612
W942 8p WHT
TY MIX
CAM GND
TITLE A/D
TY BLK
TC BLK
TB
TG
TR
IC942
DIGITAL TITLE PROCESS
IC942
MB670479U
IC941
TITLE MEMORY
IC941 CXK58256MF
Q941 DTC144EU
Q941 INVERT
CL976
R969 10k
C951 0.01 B
R950 10k
R951 10k
R952 10k
R955 10k
R956 10k
R945 10k
R946 10k
R949 10k
R958 10k
R959 10k
R941 100k
CL941
R963 2200
R964 1k
R965 2200
R966 3.9k
R967 470
R968 470
L942 1μH :3225
C944 0.47 35V :TA
C945 10 6.3V :TA
C946 0.1 F
R960 22k
L943 18μH :3225
C948 0.01 B
R961 4.7k
CL942
CT941 30P
C947 8p CH
D941 1T-33C
R962 100k
C949 0.01 B
C950 1000p
TITLE POSITION
C941 0.1 F
C942 10 6.3V :TA
L941 4.7μH :3225
C943 0.47 35V :TA
C952 0.01 B
YDLO YDL1 YDL2 WPS1 WPS2 RPS1 RPS2 NT/PAL OSCI Vss' OSCO PDUP XPDN CGMK CGIN CGBK
YRO YGO YBO YBLK HD VD Vss CRO CGO CBO CBLK SHIFT IN SI SCK CS BUSY
LCLR IO4 IO5 IO6 IO7 IO8 VDD Vss TEST2 A10 OE A11 A9 A8 A13 WE
IO3 IO2 IO1 AO A1 A2 A3 A4 Vss VDD A5 A6 A7 A12 A14 TEST1
CL968 CL969 CL970 CL971 CL972 CL973 CL974 CL975
CL943 CL944 CL945 CL946 CL947 CL948 CL949 CL950 CL951
SUPER IMPOSE
S941 COLOR /MODE
S942 MEMORY
S943 TITLE 2
S944 TITLE 1
D942 1S2837
D943 1S2837
CL952 CL953 CL954 CL955 CL956 CL957 CL958 CL959 CL960 CL961 CL962 CL963 CL964 CL965 CL966 CL967
CHASSIS GND
SS GND
SRAM CS
TITLE CS
DDS SCK
DDS SO
DDS SI
DDS B
DDS W
VD
HD
CMO 2
CMI 3
CMI 2
CMI 1
CMI 0
SS 5V
DDS B+
W941 18P FPC
TO FC-13P BOARD W882
(See page 160.)
❶ ❷

no mark : CAM REC mode
* : Impossible to measure the voltage at the marked points

SS-82P (REC/PB AMP) SCHEMATIC DIAGRAM

—Ref. No. SS-82P BOARD: 3,000 series—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I
J
SS-82P BOARD (R/P)
❶ 5Vp-p 2V IC311 ⑪ REC/PB IC312 ⑪ REC/PB
❷ 3.4Vp-p H IC311 ㉘, ㉝ REC IC312 ㉘, ㉝ REC
❸ 0.4Vp-p 2V IC312 ⑯ PB
❹ V: 50mv/div. H: 0.1μsec/div. TP317 REC
(See page 141.)
TO MECHA CHASSIS BLOCK W903
CN311 15P
Q311 FE CURRENT OUTPUT
Q313 FE OSC
Q314 PB 2CH A MUTE
Q323 REC 2CH A SWITCH
Q315 PB 2CH B MUTE
Q324 REC 2CH B SWITCH
Q325 REC 1CH A SWITCH
Q321 PB 1CH A MUTE
Q322 PB 1CH B MUTE
Q326 REC 1CH B SWITCH
IC311 CXA1202R 2CH REC/PB AMP
IC312 CXA1202R 1CH REC/PB AMP
Q316 GAIN SWITCH
Q327 1CH/2CH SWITCH
Q328 1CH/2CH SWITCH
Q329 REC/PB SWITCH
Q330 RF BUFFER
LOGIC CONTROL
REC 2A
REC 2B
REC 2CH A MID
REC 2CH B MID
REC 1A
REC 1B
REC 1CH A MID
REC 1CH B MID
TP311
TP312
TP313
TP314
TP315
TP316
TP317
CHASSIS
SS-82P BOARD
TO SS-82P BOARD (1/2) (SYSCON-SERVO)
(See page 143.)
TO SS-82P BOARD (1/2) (SYSCON-SERVO)
(See page 143.)

- Signal path
  - ➡ : REC Y Signal
  - ➡ : REC CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

	REC	REC/PB	PB
Ref. signal	➡	➡	⇨

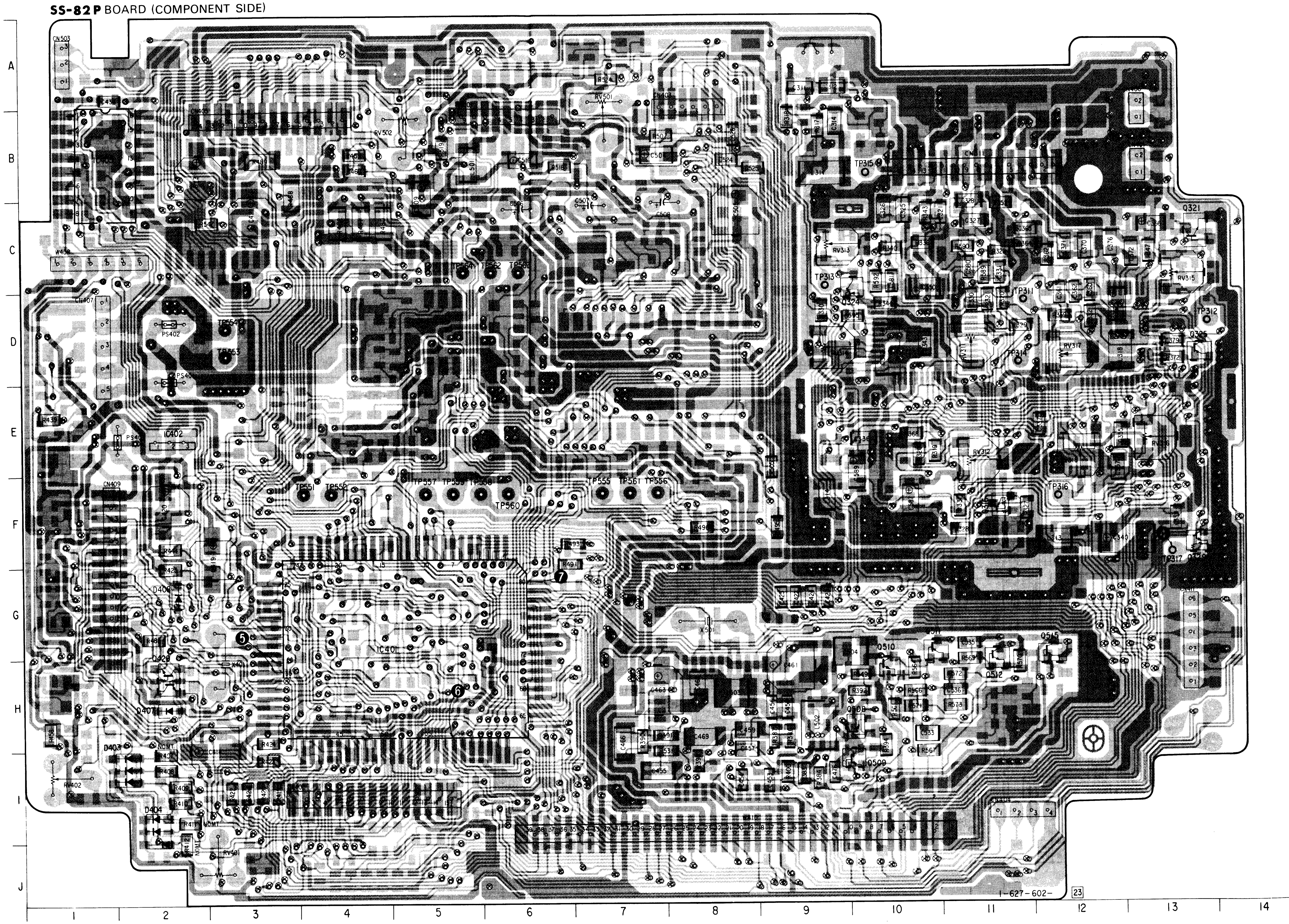
no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
* : Impossible to measure the voltage of the marked points

SS-82P (REC/PB AMP) PRINTED WIRING BOARD

—Ref. No. SS-82P BOARD: 3,000 series—

CN311	B-11
CN401	B-13
CN402	I-4
CN403	B-8
CN404	I-11
CN405	B-3
CN406	B-13
CN407	D-1
CN409	F-1
CN411	G-13
CN501	B-6
CN503	A-1
D401	I-27
D402	I-27
D403	I-2
D404	I-2
D405	I-24
D406	J-24
D407	H-2
D408	G-2
D501	B-22
D502	C-21
D503	B-22
IC311	D-18
IC312	D-16
IC401	G-5
IC402	E-2
IC403	F-27
IC404	C-24
IC405	B-1
IC406	D-24
IC501	E-21
IC502	B-21
IC503	A-23
IC504	C-26
IC505	H-21
IC506	H-18
Q311	A-9
Q313	B-19
Q314	C-18
Q315	C-19
Q316	F-11
Q318	E-19
Q321	C-13
Q322	C-17
Q323	F-19
Q324	D-10
Q325	D-13
Q326	F-17
Q327	F-19
Q328	F-16
Q329	F-13
Q330	F-17
Q401	H-27
Q402	H-24
Q403	G-25
Q404	G-25
Q405	G-24
Q407	F-26
Q408	G-24
Q409	H-24
Q410	H-25
Q411	I-25
Q412	H-25
Q413	E-28
Q414	D-28
Q415	D-28
Q416	G-25
Q417	G-28
Q418	H-28
Q419	H-28
Q420	G-27
Q421	F-28
Q422	D-24
Q423	D-25
Q424	F-24
Q425	G-27
Q426	E-26
Q427	H-27
Q428	H-26
Q429	H-2
Q435	B-28
Q436	C-24
Q501	A-22
Q502	E-25
Q503	E-25
Q504	E-24
Q506	I-19
Q508	H-10
Q509	I-10
Q510	H-10
Q511	H-11
Q512	H-11
Q515	H-12
Q516	H-18
Q522	B-22
Q524	D-23
Q525	C-22
Q526	C-21
Q527	C-21
RV311	D-11
RV312	E-11
RV313	C-10
RV314	D-10
RV315	C-13
RV316	E-13
RV317	D-12
RV318	E-12
RV401	J-3
RV402	I-1
RV501	B-7
RV502	B-5
TP311	D-12
TP312	D-13
TP313	D-9
TP314	D-11
TP315	B-10
TP316	F-12
TP317	F-13
TP551	F-4
TP552	F-4
TP553	D-3
TP554	D-3
TP555	F-7
TP556	F-7
TP557	F-5
TP558	F-6
TP559	F-5
TP560	F-6
TP561	F-7
TP562	C-6
TP563	C-6
TP564	C-5
W408	C-1
W410	J-8
W502	A-25

SS-82P BOARD (COMPONENT SIDE)


A
B
C
D
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F
G
H
I
J
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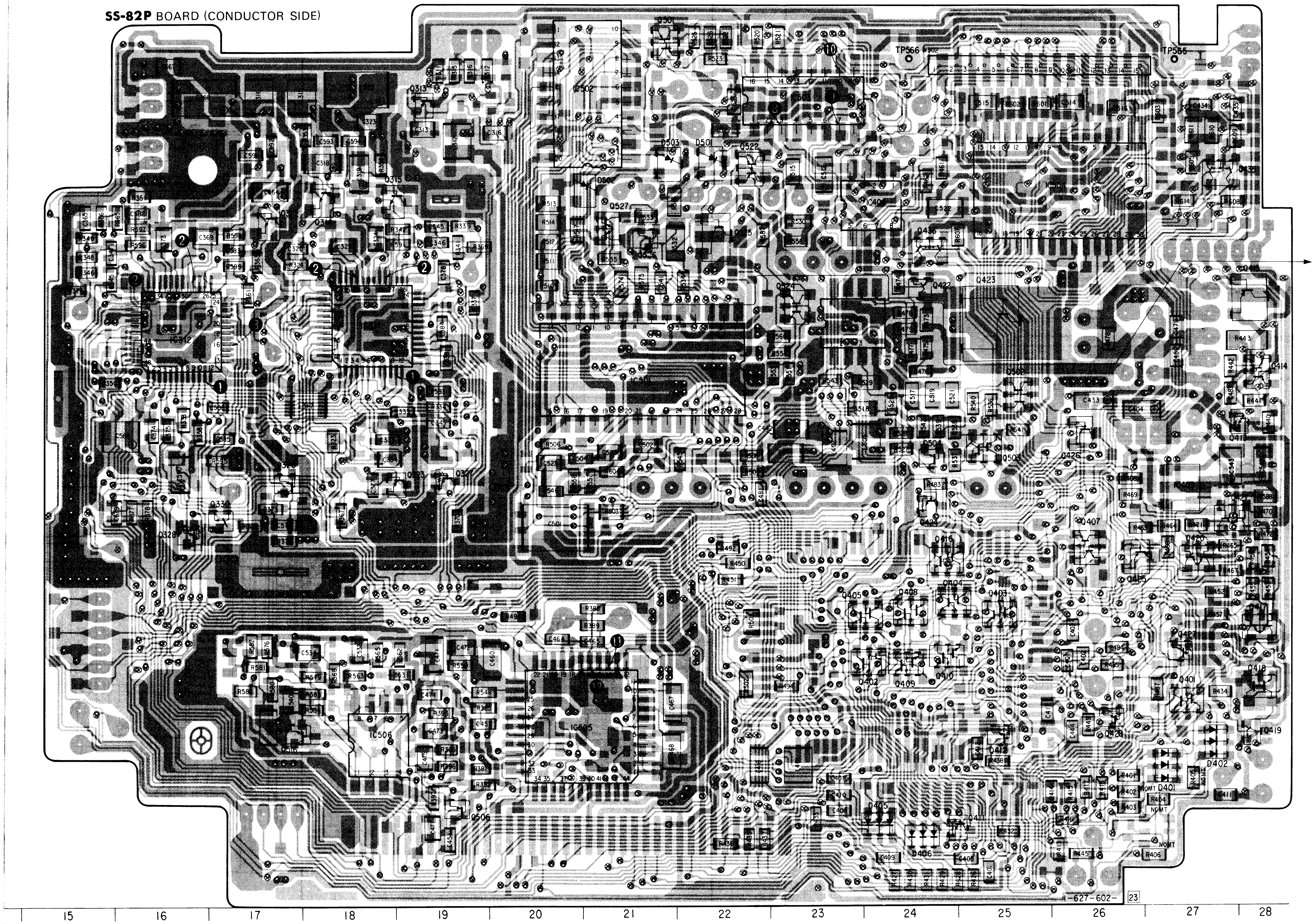
11
12
13
14
CN503
CN407
CN409
W408
PS402
PS401
IC402
TP553
TP554
TP551
TP552
TP557
TP559
TP558
TP555
TP561
TP556
TP560
TP564
TP562
TP563
IC401
RV501
RV502
RV401
RV402
D403
D404
D407
D408
Q428
X501
Q510
Q511
Q512
Q515
Q508
Q509
TP315
TP313
TP311
TP312
TP314
TP316
TP317
Q321
Q325
RV311
RV312
RV313
RV315
RV317
1-627-602-
23

SS-82P BOARD (CONDUCTOR SIDE)


IC502
IC503
IC312
IC505
IC506
TP566
TP565
Q423
D401
D402
NOMT
A-627-602-
23
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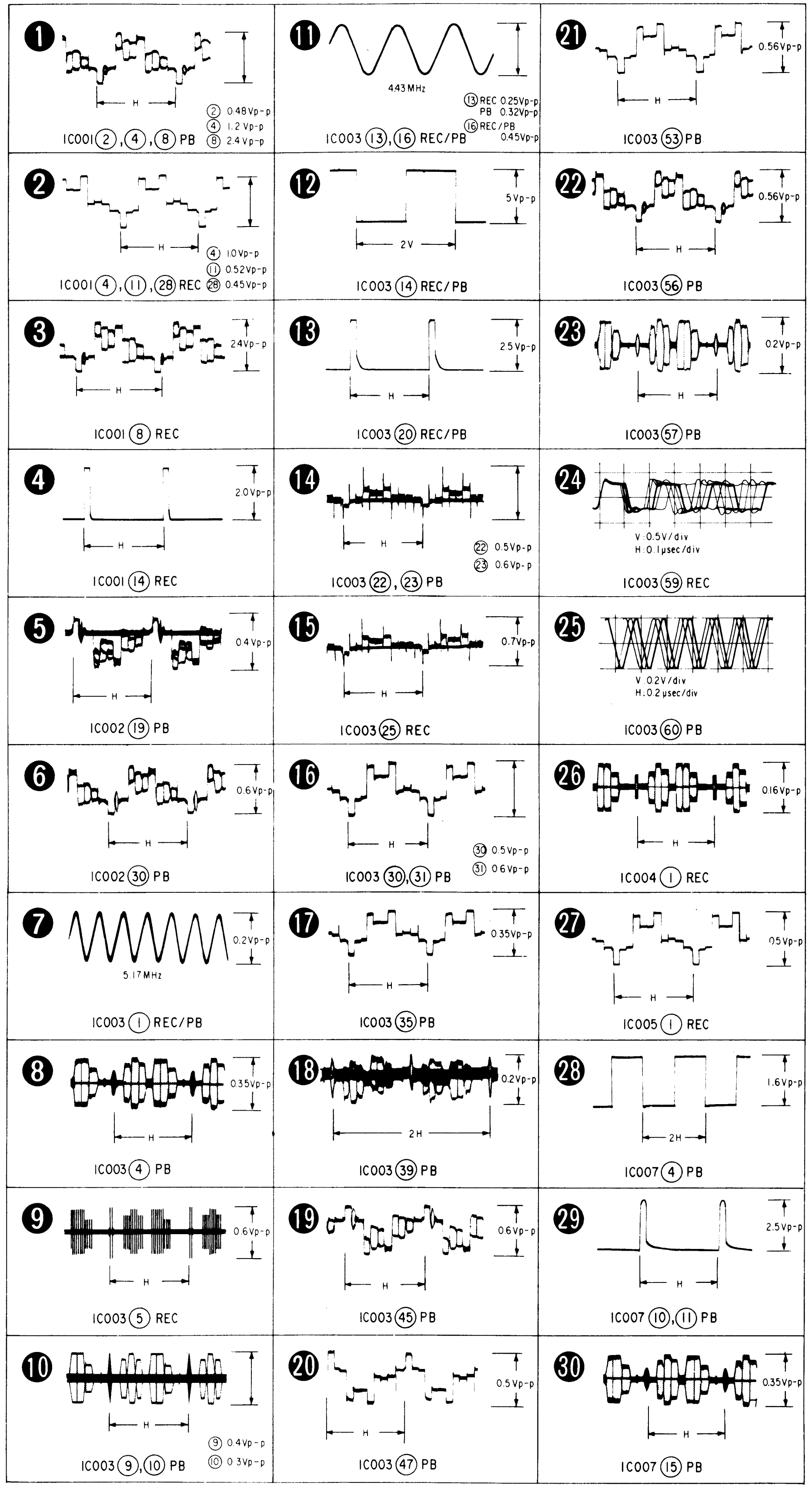
To ST-27 Board

VA-39 BOARD

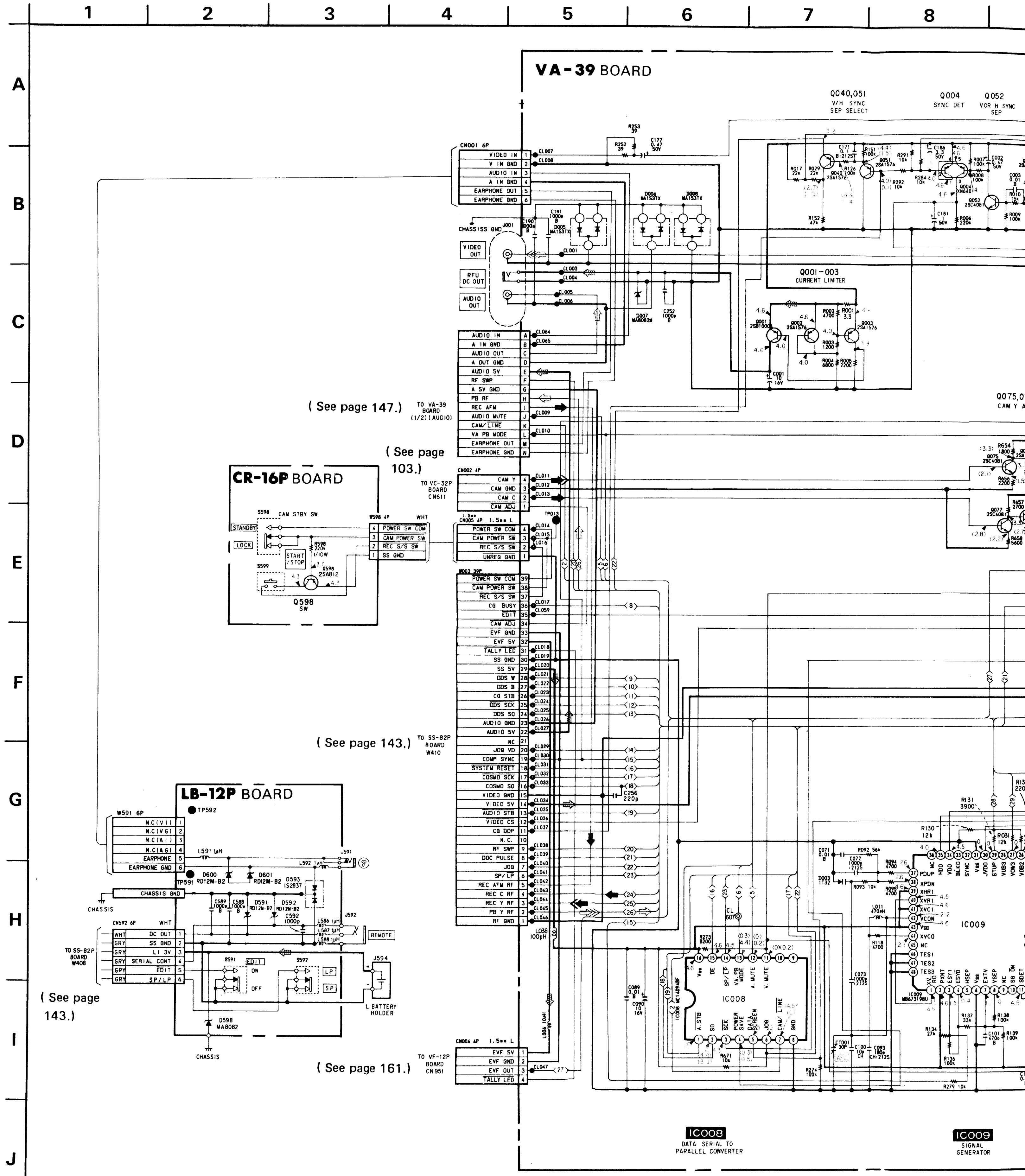


- Signal path

➡ : REC Y Signal
⇨ : PB Y Signal
➡ : REC CHROMA Signal
⇨ : PB CHROMA Signal
➡ : REC Y/CHROMA Signal
⇨ : PB Y/CHROMA Signal
➡ : REC AUDIO Signal
⇨ : PB AUDIO Signal

VA-39 (VIDEO PROCESS), LB-12P (LITHIUM BATTERY HOLDER), CR-16P (CAMERA SWITCH) SCHEMATIC DIAGRAM

—Ref. No. VA-39 BOARD: 2,000 series, LB-12P BOARD: 5,000 series, CR-16P BOARD: 7,000 series—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A
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C
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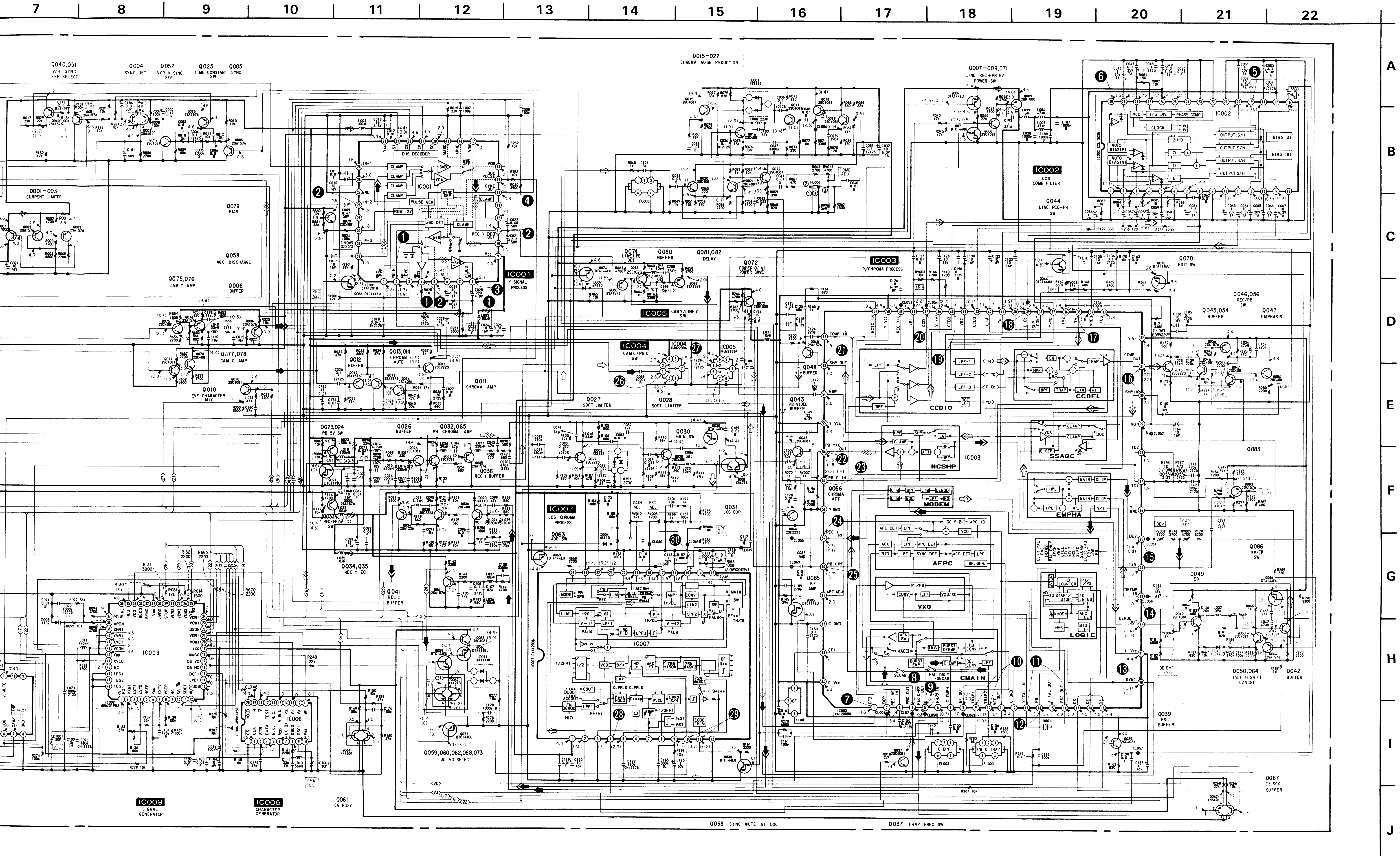
I
J
VA-39 BOARD
Q040,051
V/H SYNC
SEP SELECT
Q004
SYNC DET
Q052
VOR H SYNC
SEP
Q001-003
CURRENT LIMITER
CN001 6P
VIDEO OUT
RFU DC OUT
AUDIO OUT
(See page 147.)
TO VA-39 BOARD
(See page 103.)
TO VC-32P BOARD CN611
CR-16P BOARD
CAM STBY SW
STANDBY
LOCK
START /STOP
Q598
(See page 143.)
TO SS-82P BOARD W410
LB-12P BOARD
TP592
W591 6P
CHASSIS
TO SS-82P BOARD W408
REMOTE
LP
SP
L BATTERY HOLDER
CHASSIS
(See page 143.)
(See page 161.)
TO VF-12P BOARD CN951
IC008
IC009
IC008
DATA SERIAL TO PARALLEL CONVERTER
IC009
SIGNAL GENERATOR
Q075,0
CAM Y

CH) SCHEMATIC DIAGRAM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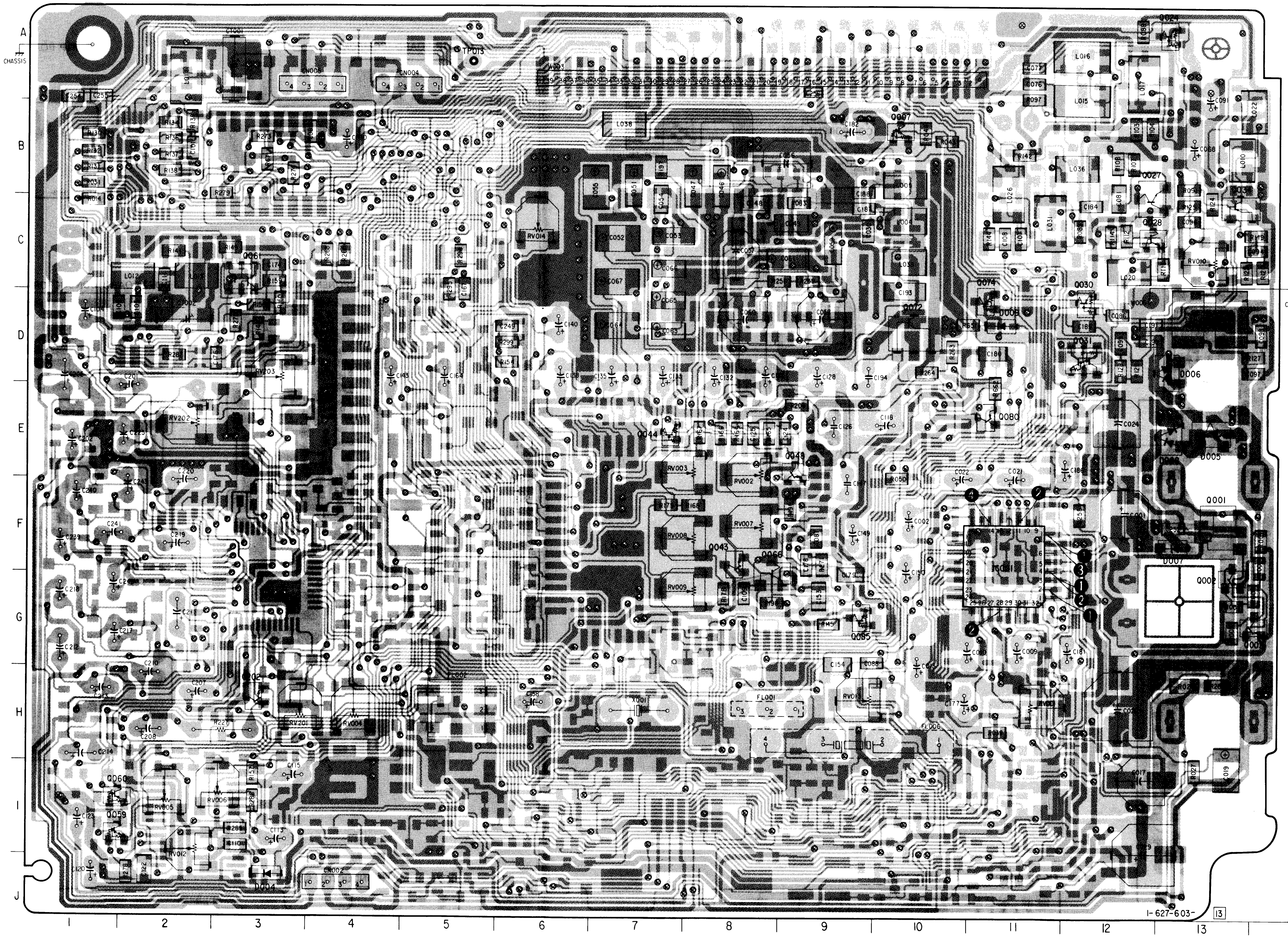
Q040,051 V/H SYNC SEP SELECT
Q004 SYNC DET
Q052 VOR H SYNC SEP
Q025 TIME CONSTANT SW
Q005 SYNC
Q015-022 CHROMA NOISE REDUCTION
Q007-009,071 LINE REC+PB 5V POWER SW
IC002 CCD COMB FILTER
Q044 LINE REC+PB SW
Q001-003 CURRENT LIMITER
Q079 BIAS
Q058 AGC DISCHARGE
Q075,076 CAM Y AMP
Q006 BUFFER
IC001 Y SIGNAL PROCESS
DUS DECODER
CLAMP
AGC DET
SYNC SEP
PULSE GEN
REC VIDEO OUT
SYNC OUT
Q074 LINE+PB DET
Q080 BUFFER
Q081,082 DELAY
Q072 POWER OFF AT POWER SAVE
IC003 Y/CHROMA PROCESS
Q070 EDIT SW
IC005 CAM Y/LINE Y SW
Q077,078 CAM C AMP
Q010 EVF CHARACTER MIX
Q012 BUFFER
Q013,014 CHROMA MUTE
Q011 CHROMA AMP
IC004 CAM C/PB C SW
Q027 SOFT LIMITER
Q028 SOFT LIMITER
Q048 BUFFER
Q043 PB VIDEO BUFFER
CCD10
CCDFL
Q046,056 REC/PB SW
Q045,054 BUFFER
Q047 EMPHASIS
Q023,024 PB 5V SW
Q026 BUFFER
Q032,065 PB CHROMA AMP
Q036 REC Y BUFFER
Q030 GAIN SW
NCSHP
SSAGC
Q083
Q066 CHROMA ATT
MODEM
EMPHA
IC007 JOG CHROMA PROCESS
Q063 JOG SW
Q031 JOG DOP
Q033 REC/EE 5V SW
Q034,035 REC Y EQ
Q041 REC C BUFFER
AFPC
VXO
LOGIC
Q085 BF AMP
Q086 SP/LP SW
Q049 EQ
CMAIN
Q050,064 HALF H SHIFT CANCEL
Q042 BUFFER
Q039 FSC BUFFER
IC009 SIGNAL GENERATOR
IC006 CHARACTER GENERATOR
Q061 CG BUSY
Q059,060,062,068,073 JO VD SELECT
Q038 SYNC MUTE AT DOC
Q037 TRAP FREQ SW
Q067 CS,SCK BUFFER

VA-39 (VIDEO PROCESS), LB-12P (LITHIUM BATTERY HOLDER), CR-16P (CAMERA SWITCH) PRINTED WIRING BOARDS

—Ref. No. VA-39 BOARD: 2,000 series, LB-12P BOARD: 5,000 series, CR-16P BOARD: 7,000 series—

CN001	I-21
CN002	J-4
CN004	A-4
CN005	A-3
CN021	C-28
CT001	A-3
CT002	D-2
D001	I-22
D002	B-17
D003	A-26
D004	J-3
D005	E-13
D006	D-13
D007	F-13
D008	E-13
D009	D-11
D010	G-24
D011	I-28
D020	D-16
IC001	F-11
IC002	C-20
IC003	F-21
IC004	G-19
IC005	D-18
IC006	D-26
IC007	I-26
IC008	B-25
IC009	B-27
IC201	G-26
Q001	F-13
Q002	G-13
Q003	G-13
Q004	E-17
Q005	F-18
Q006	J-19
Q007	B-10
Q008	C-19
Q009	C-18
Q010	H-17
Q011	J-17
Q012	J-18
Q013	I-17
Q014	I-18
Q015	I-22
Q016	I-22
Q017	I-20
Q018	I-20
Q019	I-20
Q020	I-23
Q021	I-19
Q022	I-19
Q023	B-15
Q024	A-12
Q025	G-18
Q026	B-17
Q027	B-12
Q028	C-12
Q030	D-12
Q031	D-12
Q032	B-17
Q033	B-15
Q034	C-13
Q035	C-16
Q036	C-16
Q037	H-24
Q038	I-27
Q039	H-22
Q040	G-17
Q041	B-18
Q042	F-24
Q043	F-8
Q044	E-7
Q045	C-23
Q046	C-24
Q047	D-24
Q048	E-9
Q049	F-24
Q050	F-23
Q051	G-18
Q052	F-17
Q054	D-24
Q056	D-24
Q058	G-17
Q059	I-1
Q060	I-1
Q061	C-3
Q062	I-27
Q063	H-26
Q064	F-23
Q065	C-17
Q066	F-8
Q067	C-25
Q068	H-25
Q070	D-23
Q071	B-19
Q072	D-10
Q073	H-26
Q074	D-11
Q075	I-25
Q076	I-24
Q077	J-24
Q078	J-24
Q079	H-17
Q080	E-11
Q081	E-19
Q082	E-19
Q083	D-23
Q085	G-9
Q086	E-24
Q201	F-25
Q202	H-3
Q203	G-26
Q204	G-27
RV001	H-11
RV002	E-8
RV003	E-7
RV004	H-4
RV005	I-2
RV006	I-2
RV007	F-8
RV008	F-7
RV009	G-7
RV010	C-13
RV012	I-2
RV013	H-9
RV014	C-6
RV201	H-3
RV202	E-2
RV203	D-3
TP013	A-5
W003	A-8
W006	D-12

VA-39 BOARD (COMPONENT SIDE)


A
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I
J
CHASSIS
TP013
CN004
CN005
CN002
RV014
RV003
RV002
RV007
RV008
RV009
RV001
RV004
RV201
RV202
RV203
RV005
RV006
RV012
RV010
IC001
X001
FL001
FL006
L038
L016
L015
L036
Q001
Q002
Q005
D006
D007
Q080
Q085
Q060
Q059
D004
1-627-603- 13
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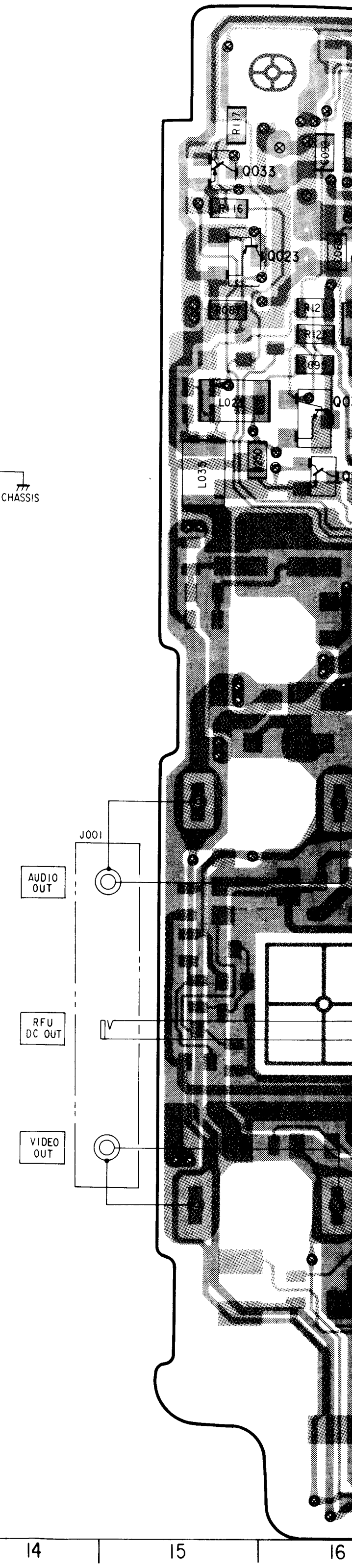
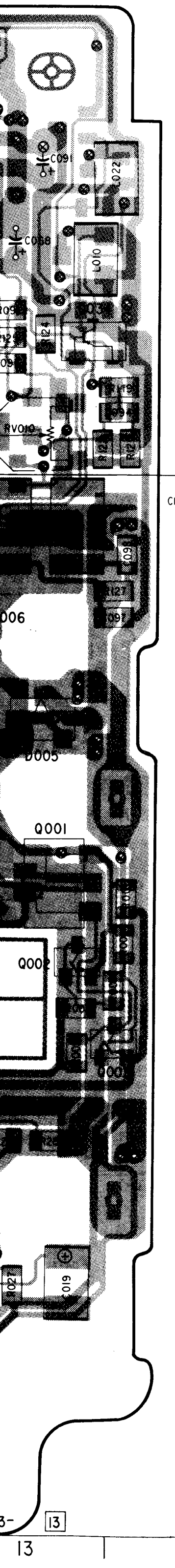
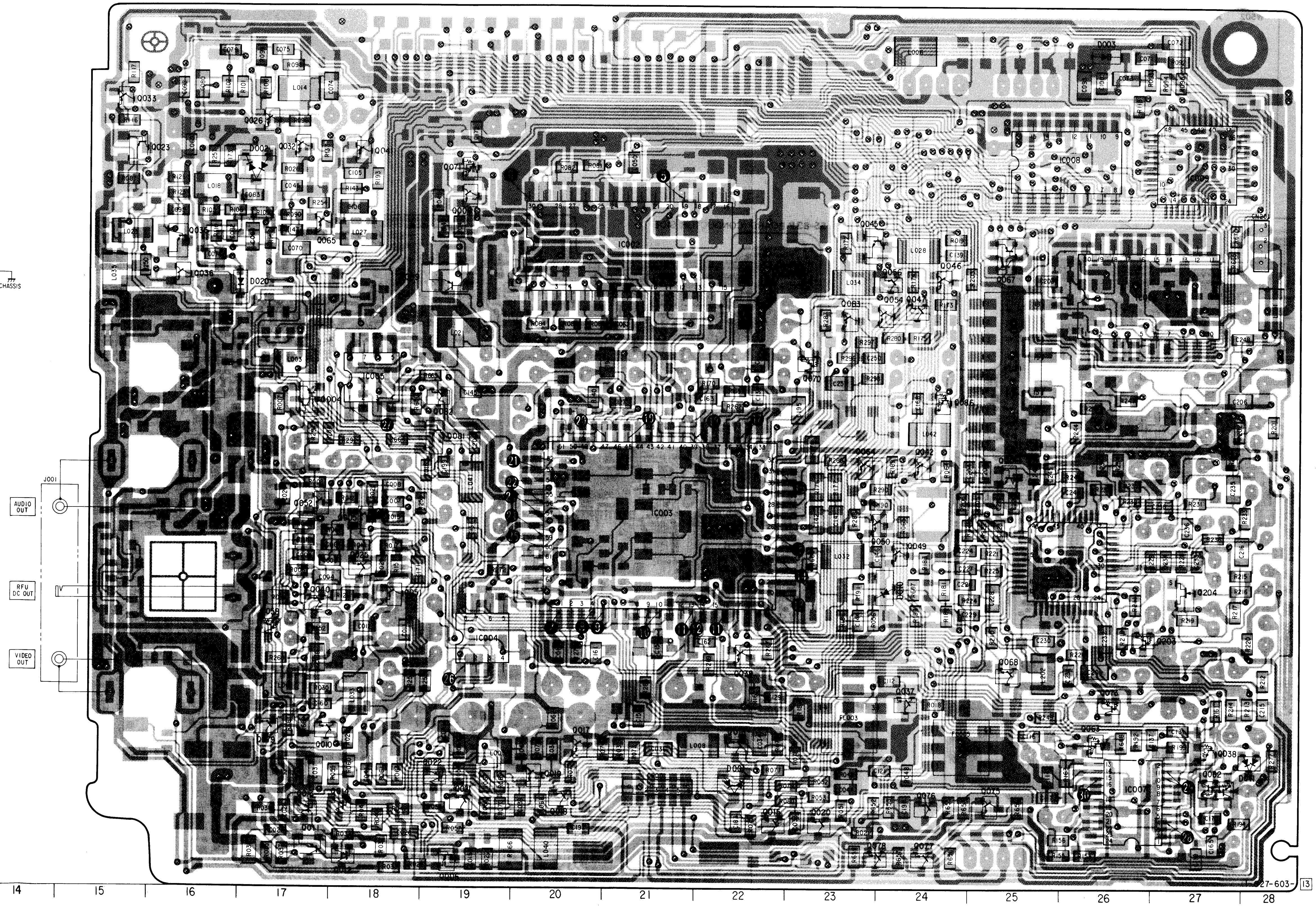
16

VA-39 BOARD


CHASSIS
J001
AUDIO OUT
RFU DC OUT
VIDEO OUT
Q033
Q023

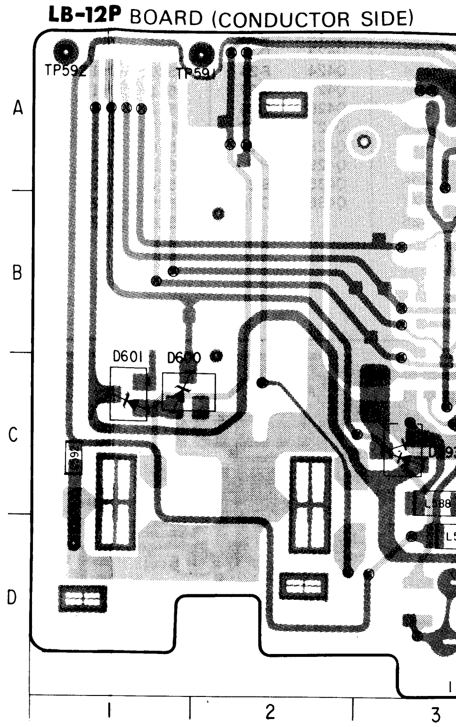

CHASSIS
Q001
Q002
Q005
RV010
13
14

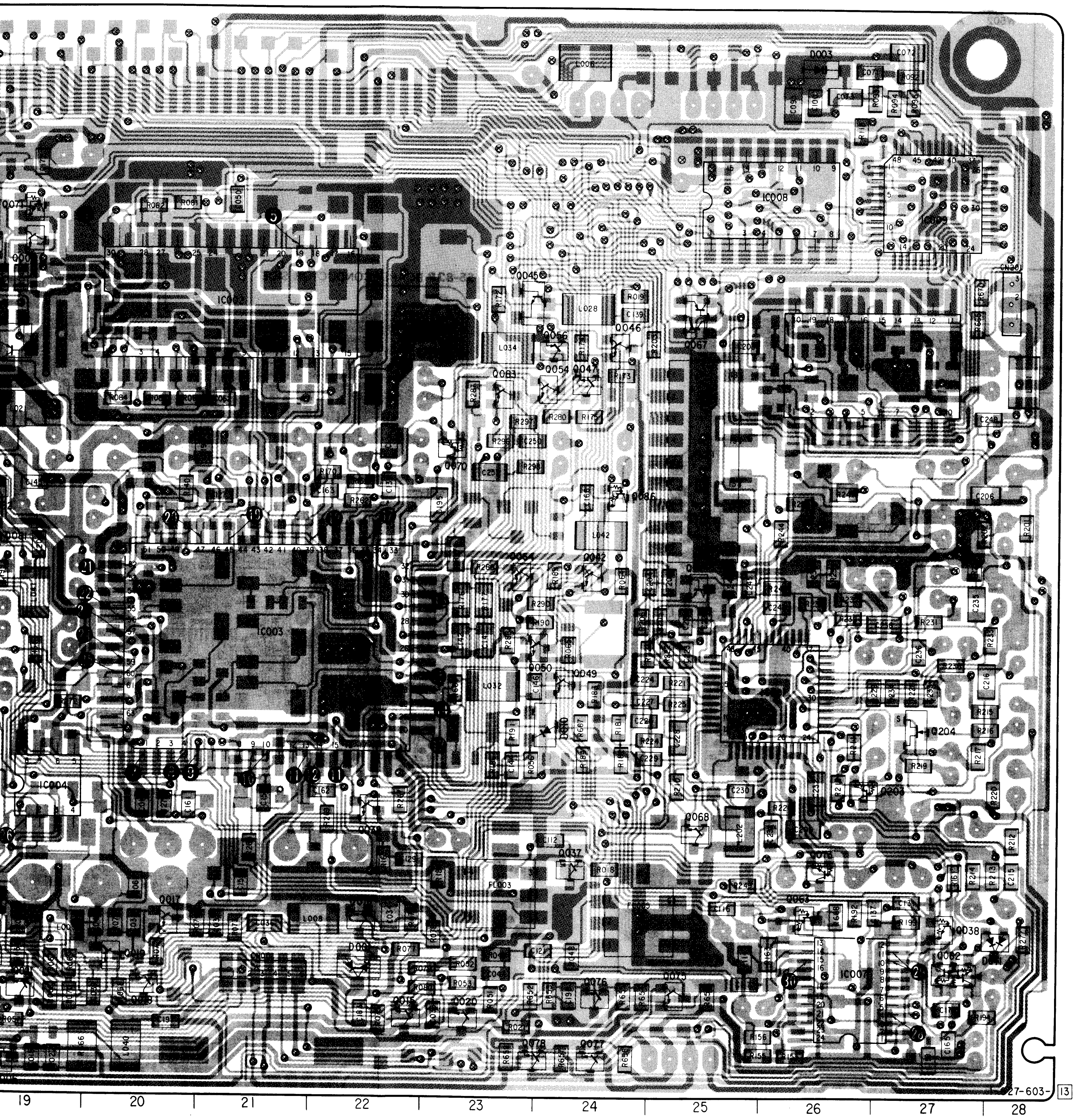
VA-39 BOARD (CONDUCTOR SIDE)


J001
AUDIO OUT
RFU DC OUT
VIDEO OUT
IC002
IC003
IC004
IC005
IC007
IC008
15
16
17
18
19
20
21
22
23
24
25
26
27
28
27-603- 13

CN592	A-5
D591	A-6
D592	A-6
D593	C-3
D598	A-5
D600	C-2
D601	C-1
TP591	A-2
TP592	A-1
W591	A-7

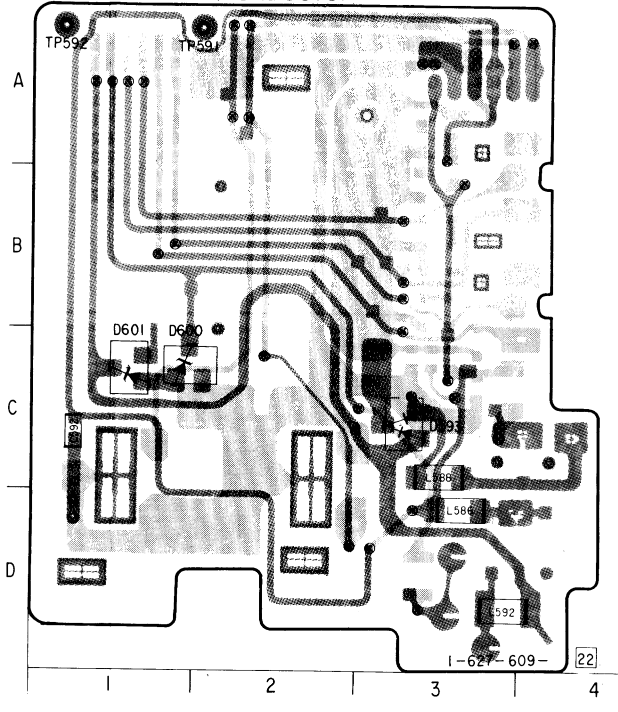
LB-12P BOARD (CONDUCTOR SIDE)


TP592
TP591
D601
D600
A
B
C
D
1
2
3

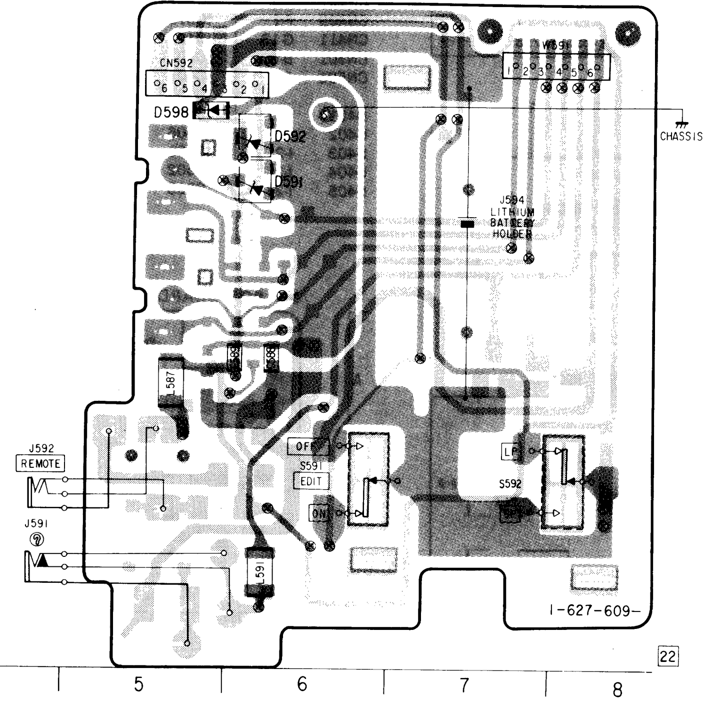

IC003
IC004
IC007
IC008
Q045
Q046
Q047
Q049
Q050
Q054
Q066
Q067
Q068
Q070
Q204
L028
L032
L034
L042
1-627-603-
13
19
20
21
22
23
24
25
26
27
28

CN592	A-5
D591	A-6
D592	A-6
D593	C-3
D598	A-5
D600	C-2
D601	C-1
TP591	A-2
TP592	A-1
W591	A-7

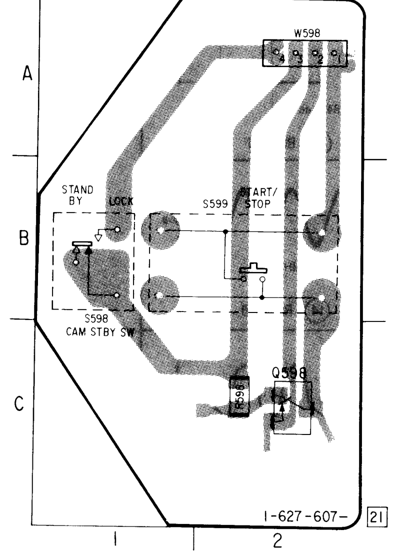
LB-12P BOARD (CONDUCTOR SIDE)


TP592
TP591
D601
D600
D593
L588
L586
L592
1-627-609-
22
A
B
C
D
1
2
3
4

LB-12P BOARD(COMPONENT SIDE)


CN592
D598
D592
D591
J594
LITHIUM
BATTERY
HOLDER
CHASSIS
W591
J592
REMOTE
J591
L587
L591
OFF
S591
EDIT
ON
LP
S592
1-627-609-
22
5
6
7
8

CR-16P BOARD (COMPONENT SIDE)


W598
A
B
C
STAND
BY
LOCK
S599
START/
STOP
S598
CAM STBY SW
Q598
1-627-607-
21
1
2

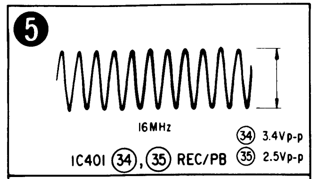
SERVO/SYSTEM CONTROL

SS-82P, ST-27 (SERVO/SYSTEM CONTROL), DD-7 (SWITCHING REG, MOTOR DRIVER), FP-115 (TAPE T/E SENSE, TAPE SELECT), FU-61P (BATTERY HOLDER), FK-7P (MODE SWITCH) PRINTED WIRING BOARDS

—Ref. No. SS-82P BOARD, ST-27 BOARD: 3,000 series, DD-7 BOARD: 4,000 series, FP-115 BOARD: 5,000 series, FU-61P BOARD: 6,000 series, FK-7P BOARD: 8,000 series—

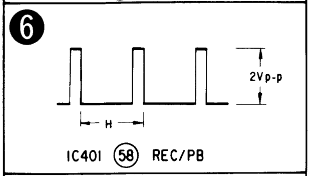
SS-82P BOARD (SYSCON/SERVO)

❺



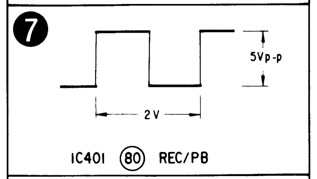
IC401 ㉞, ㉟ REC/PB

❻



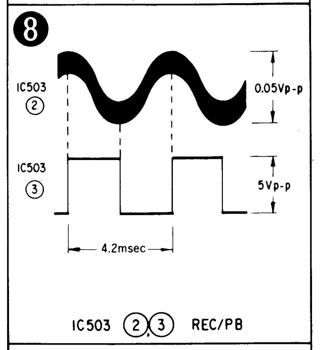
IC401 (58) REC/PB

❼



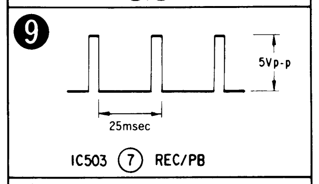
IC401 (80) REC/PB

❽



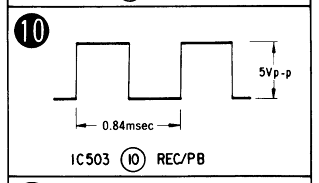
IC503 ②③ REC/PB

❾



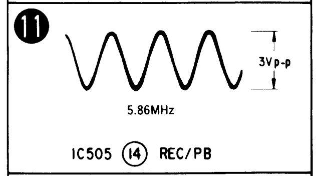
IC503 ⑦ REC/PB

❿



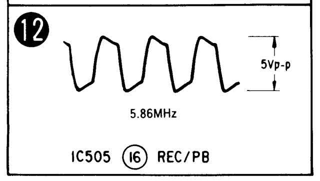
IC503 ⑩ REC/PB

⓫



IC505 ⑭ REC/PB

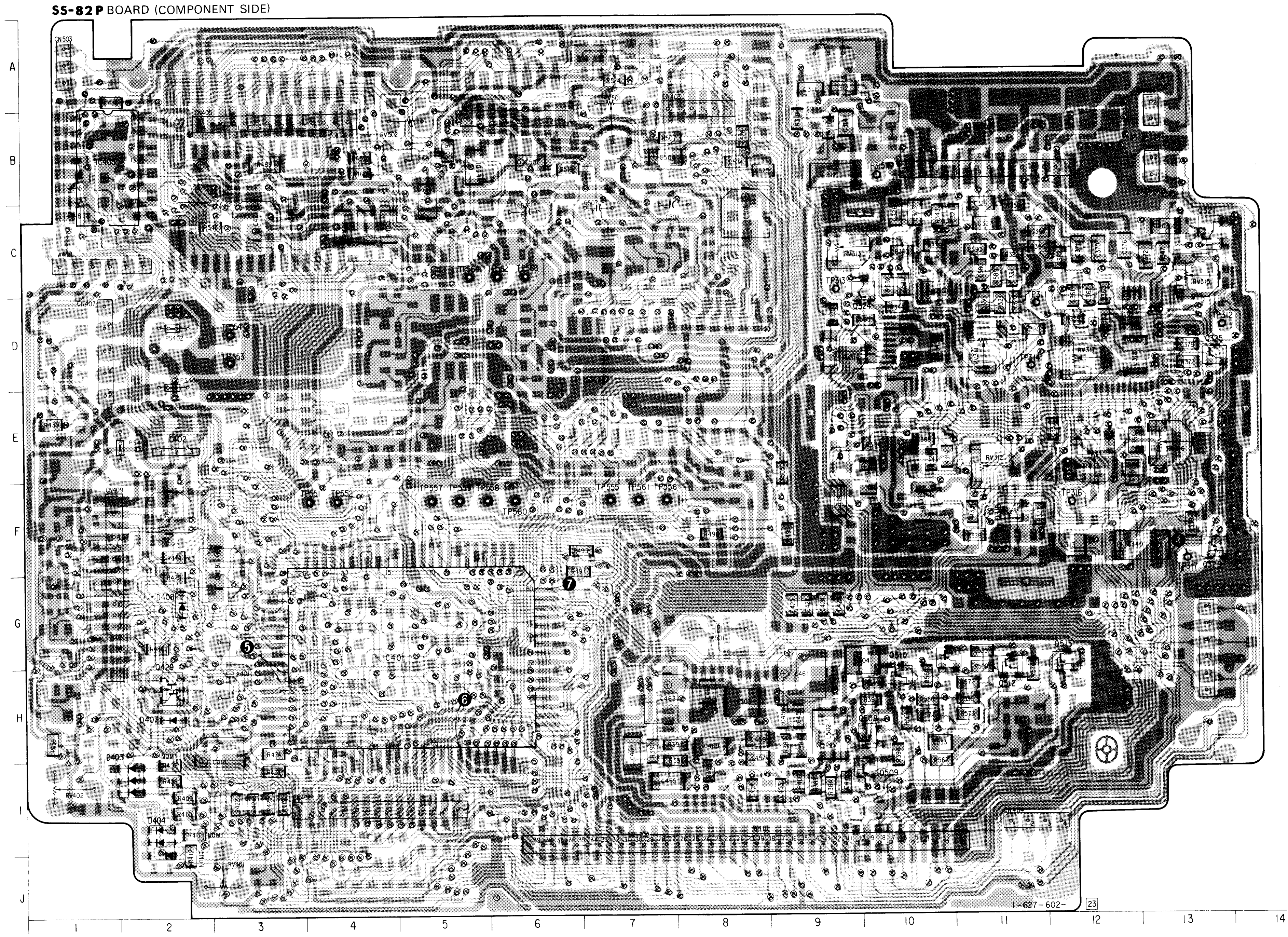
⓬



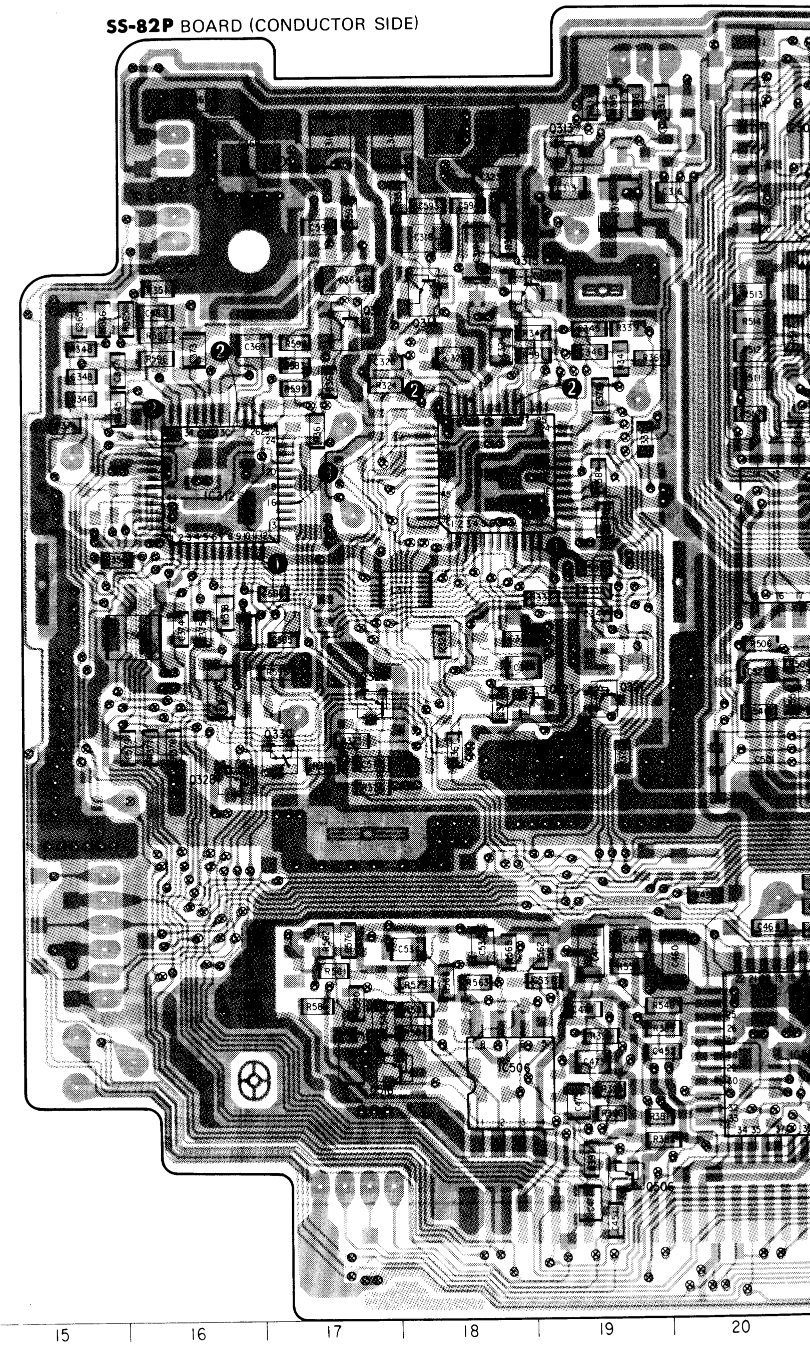
IC505 ⑯ REC/PB

CN311	B-11
CN401	B-13
CN402	I-4
CN403	B-8
CN404	I-11
CN405	B-3
CN406	B-13
CN407	D-1
CN409	F-1
CN411	G-13
CN501	B-6
CN503	A-1
D401	I-27
D402	I-27
D403	I-2
D404	I-2
D405	I-24
D406	J-24
D407	H-2
D408	G-2
D501	B-22
D502	C-21
D503	B-22
IC311	D-18
IC312	D-16
IC401	G-5
IC402	E-2
IC403	F-27
IC404	C-24
IC405	B-1
IC406	D-24
IC501	E-21
IC502	B-21
IC503	A-23
IC504	C-26
IC505	H-21
IC506	H-18
Q311	A-9
Q313	B-19
Q314	C-18
Q315	C-19
Q316	F-11
Q318	E-19
Q321	C-13
Q322	C-17
Q323	F-19
Q324	D-10
Q325	D-13
Q326	F-17
Q327	F-19
Q328	F-16
Q329	F-13
Q330	F-17
Q401	H-27
Q402	H-24
Q403	G-25
Q404	G-25
Q405	G-24
Q407	F-26
Q408	G-24
Q409	H-24
Q410	H-25
Q411	I-25
Q412	H-25
Q413	E-28
Q414	D-28
Q415	D-28
Q416	G-25
Q417	G-28
Q418	H-28
Q419	H-28
Q420	G-27
Q421	F-28
Q422	D-24
Q423	D-25
Q424	F-24
Q425	G-27
Q426	E-26
Q427	H-27
Q428	H-26
Q429	H-2
Q435	B-28
Q436	C-24
Q501	A-22
Q502	E-25
Q503	E-25
Q504	E-24
Q506	I-19
Q508	H-10
Q509	I-10
Q510	H-10
Q511	H-11
Q512	H-11
Q515	H-12
Q516	H-18
Q522	B-22
Q524	D-23
Q525	C-22
Q526	C-21
Q527	C-21
RV311	D-11
RV312	E-11
RV313	C-10
RV314	D-10
RV315	C-13
RV316	E-13
RV317	D-12
RV318	E-12
RV401	J-3
RV402	I-1
RV501	B-7
RV502	B-5
TP311	D-12
TP312	D-13
TP313	D-9
TP314	D-11
TP315	B-10
TP316	F-12
TP317	F-13
TP551	F-4
TP552	F-4
TP553	D-3
TP554	D-3
TP555	F-7
TP556	F-7
TP557	F-5
TP558	F-6
TP559	F-5
TP560	F-6
TP561	F-7
TP562	C-6
TP563	C-6
TP564	C-5
W408	C-1
W410	J-8
W502	A-25

SS-82P BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
IC401
IC402
TP551
TP552
TP553
TP554
TP557
TP559
TP558
TP560
TP555
TP561
TP556
TP311
TP312
TP313
TP314
TP315
TP316
TP317
RV312
RV315
Q510
Q512
1-627-602-
23

SS-82P BOARD (CONDUCTOR SIDE)

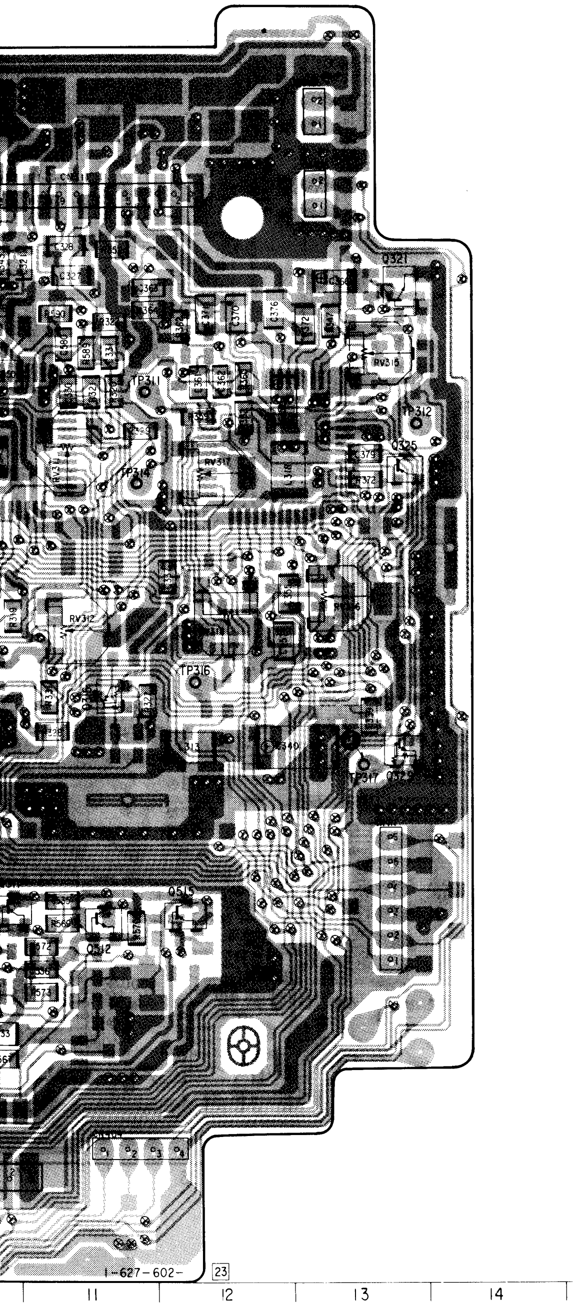


ENSE, TAPE SELECT), FU-61P (BATTERY HOLDER), FK-7P (MODE SWITCH) PRINTED WIRING BOARDS

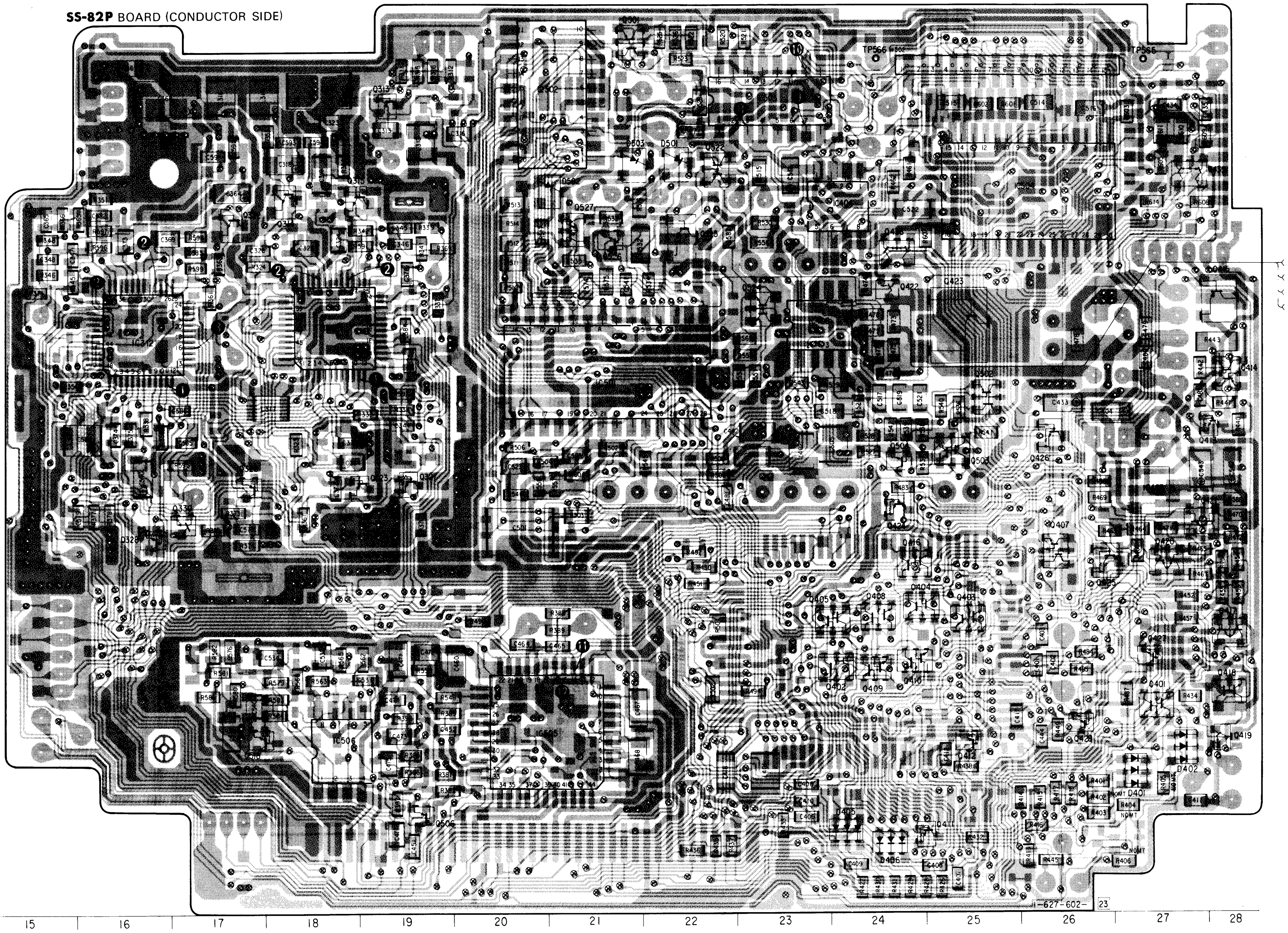
): 6,000 series, FK-7P BOARD: 8,000 series—

5

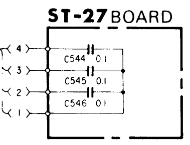
1
8
25


Q321
TP312
Q325
RV317
RV312
TP316
Q328
Q515
Q512
1-627-602-
23
11
12
13
14

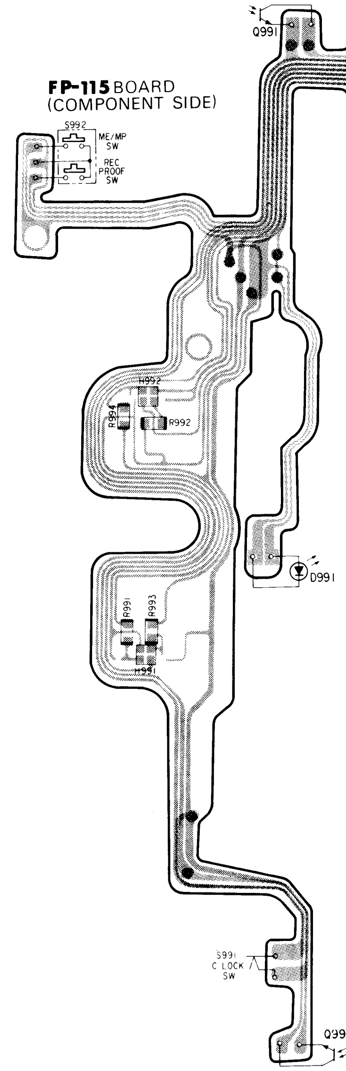
SS-82P BOARD (CONDUCTOR SIDE)


TP566
TP565
Q503
D501
Q527
Q422
Q423
Q414
Q426
Q407
Q405
Q402
Q409
Q401
Q419
D402
D401
NGMT
Q505
Q506
1-627-602-
23
15
16
17
18
19
20
21
22
23
24
25
26
27
28

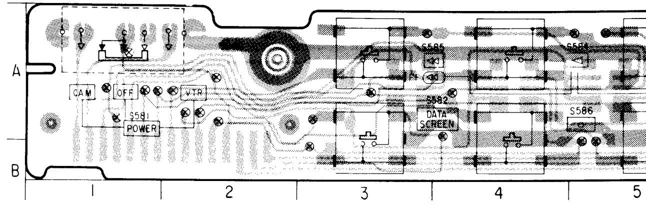
ST-27 BOARD

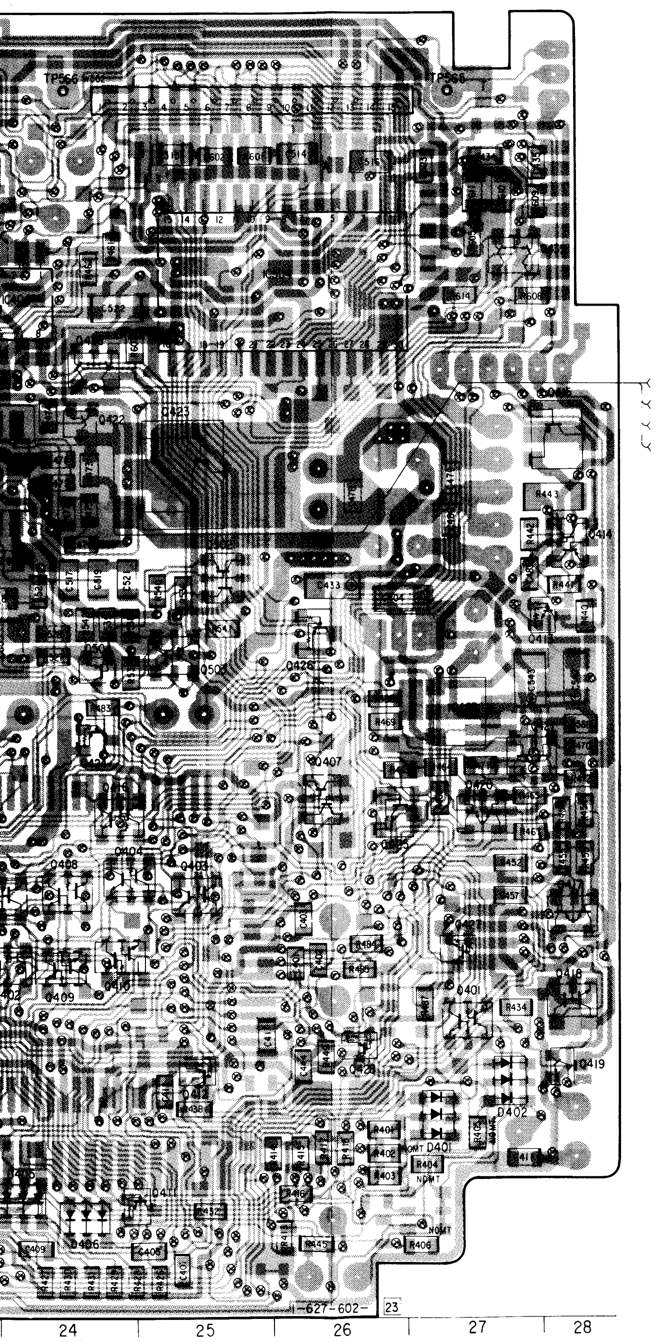

4
3
2
1
C544 0.1
C545 0.1
C546 0.1

FP-115 BOARD
(COMPONENT SIDE)

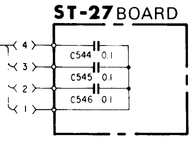

Q991
S992
ME/MP SW
REC PROOF SW
H992
R994
R992
R991
R993
D991
S991
C LOCK SW
Q99

FK-7P BOARD (COMPONENT SIDE)

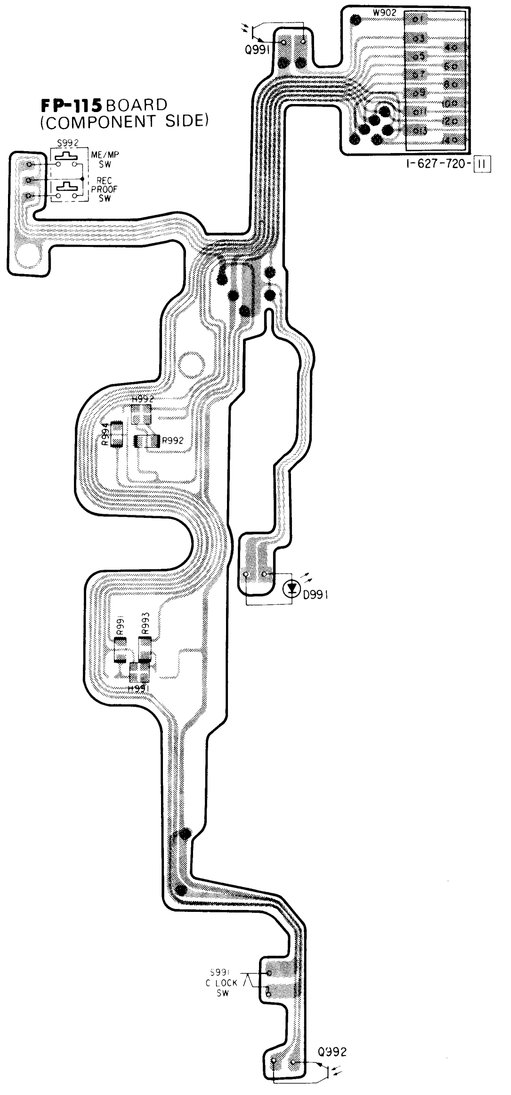

A
B
CAM
OFF
VTR
S581
POWER
S585
S584
S582
DATA SCREEN
S586
1
2
3
4
5


TP566
TP568
Q422
Q423
Q426
Q407
Q401
Q402
D402
D401
D419
NOMT
1-627-602-23
24
25
26
27
28

ST-27 BOARD

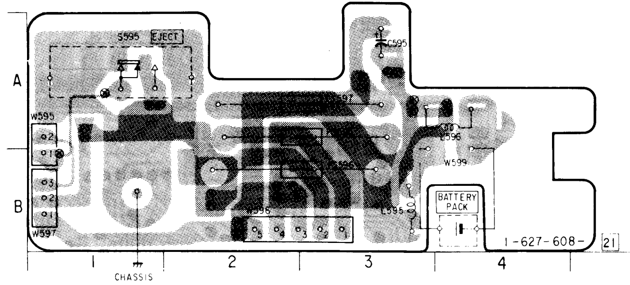

C544 0.1
C545 0.1
C546 0.1
4
3
2
1

FP-115 BOARD (COMPONENT SIDE)

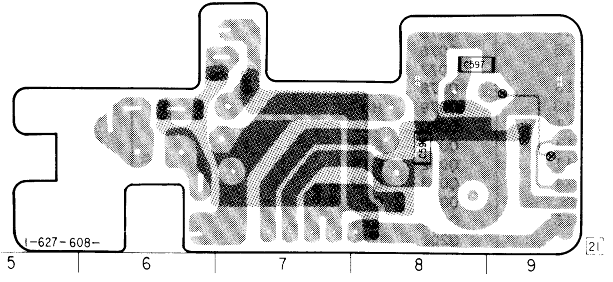

Q991
W902
S992
ME/MP SW
REC PROOF SW
1-627-720-11
R992
D991
S991
C LOCK SW
Q992

FU-61P BOARD (COMPONENT SIDE)

W595	A-1
W596	B-2
W597	B-1
W599	B-4

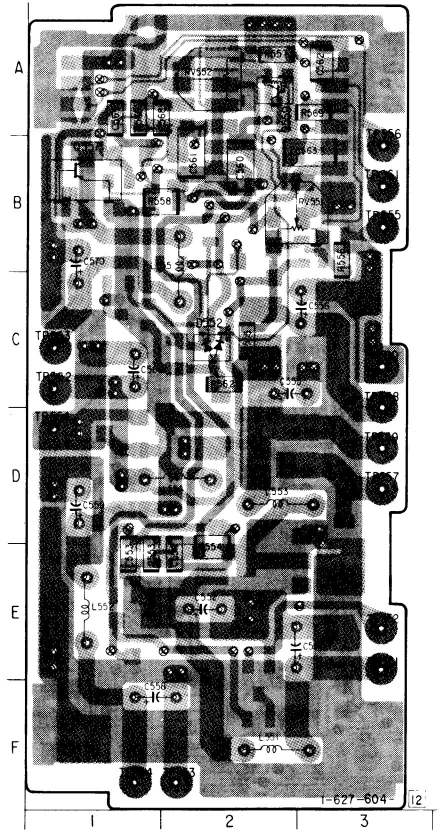

S595
EJECT
W595
W597
W599
BATTERY PACK
CHASSIS
1-627-608-21
A
B
1
2
3
4

FU-61P BOARD (CONDUCTOR SIDE)

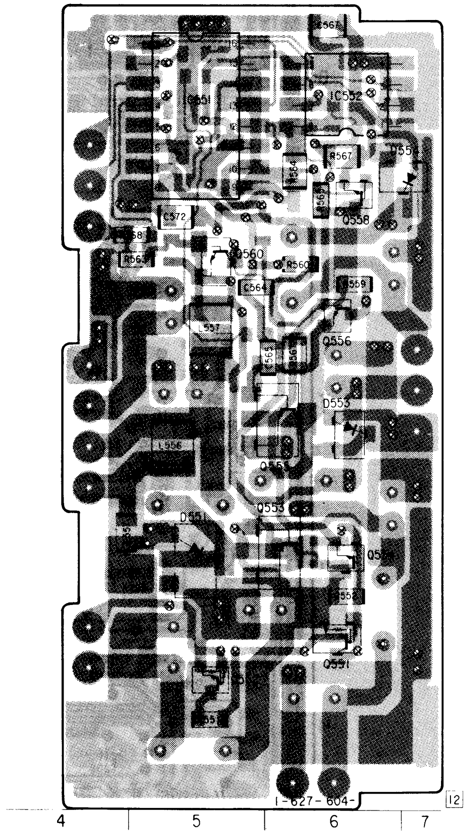

C597
1-627-608-
21
5
6
7
8
9

DD-7 BOARD (COMPONENT SIDE)

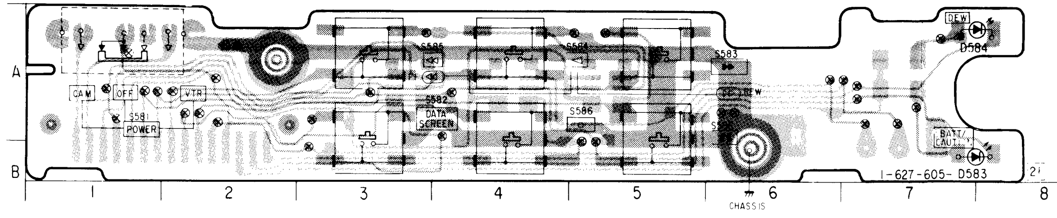
Q551	E-6
Q552	F-5
Q553	E-6
Q554	D-6
Q555	D-6
Q556	C-6
Q557	B-1
Q558	B-6
Q559	A-2
Q560	B-5
RV551	B-3
RV552	A-2
TP551	E-3
TP552	E-3
TP553	F-2
TP554	F-1
TP555	B-3
TP556	B-3
TP557	D-3
TP558	C-3
TP559	D-3
TP560	C-3
TP561	B-3
TP562	C-1
TP563	C-1
TP564	D-1
D551	D-5
D552	C-2
D553	D-6
D554	B-7
IC551	A-5
IC552	A-6


A
B
C
D
E
F
1-627-604-12
1
2
3

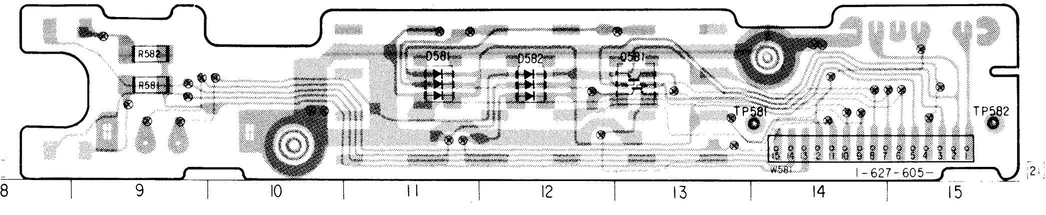
DD-7 BOARD (CONDUCTOR SIDE)


IC552
Q560
Q556
D553
Q551
1-627-604-
12
4
5
6
7

FK-7P BOARD (COMPONENT SIDE)


CAM
OFF
VTR
S581
POWER
DATA SCREEN
D584
D583
CHASSIS
1-627-605-
A
B
1
2
3
4
5
6
7
8

FK-7P BOARD (CONDUCTOR SIDE)

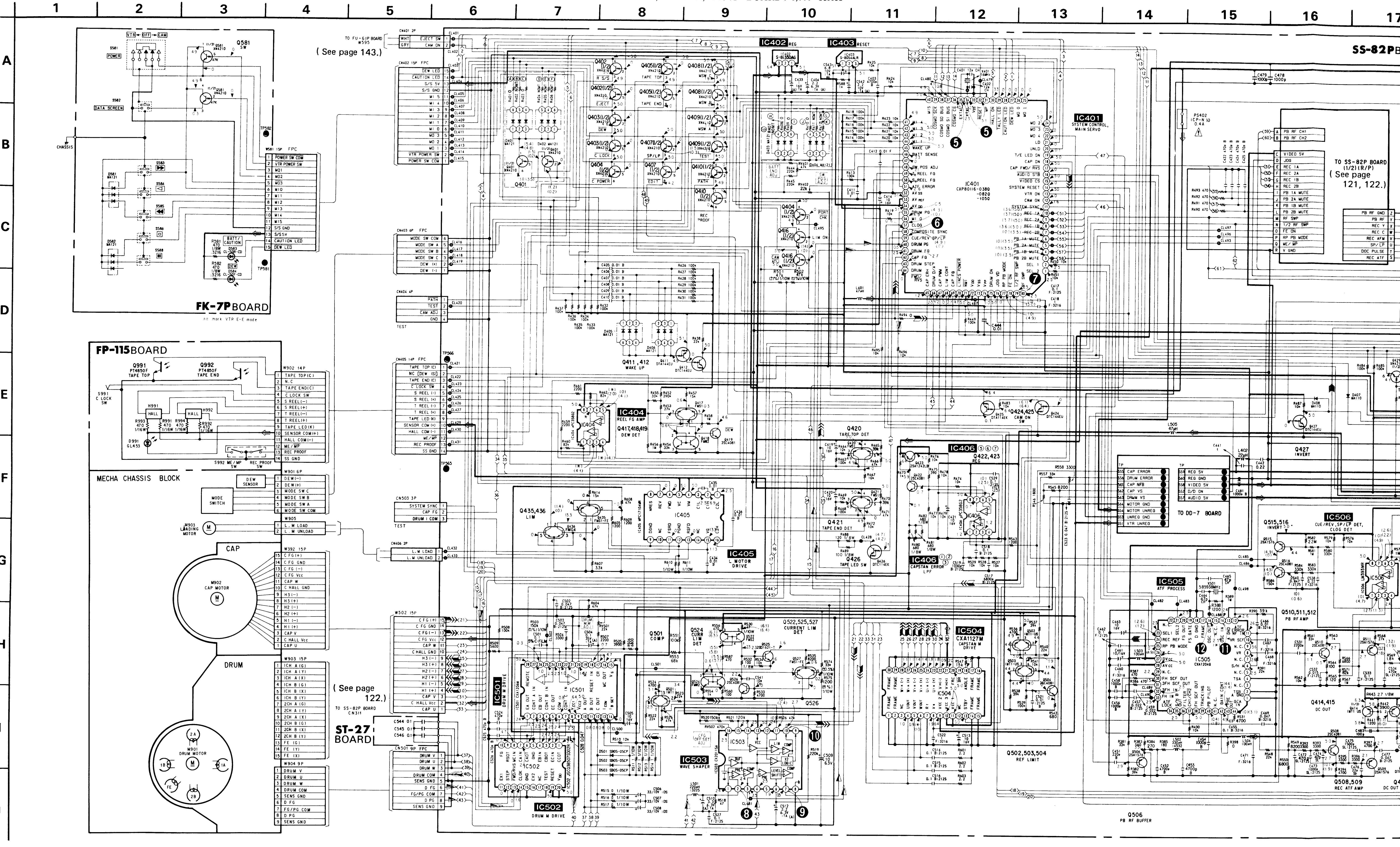

D581
D582
Q581
TP581
TP582
W581
1-627-605-
9
10
11
12
13
14
15

D581	A-11
D582	A-12
D583	B-7
D584	A-7
Q581	A-13
TP581	A-14
TP582	A-15
W581	B-14

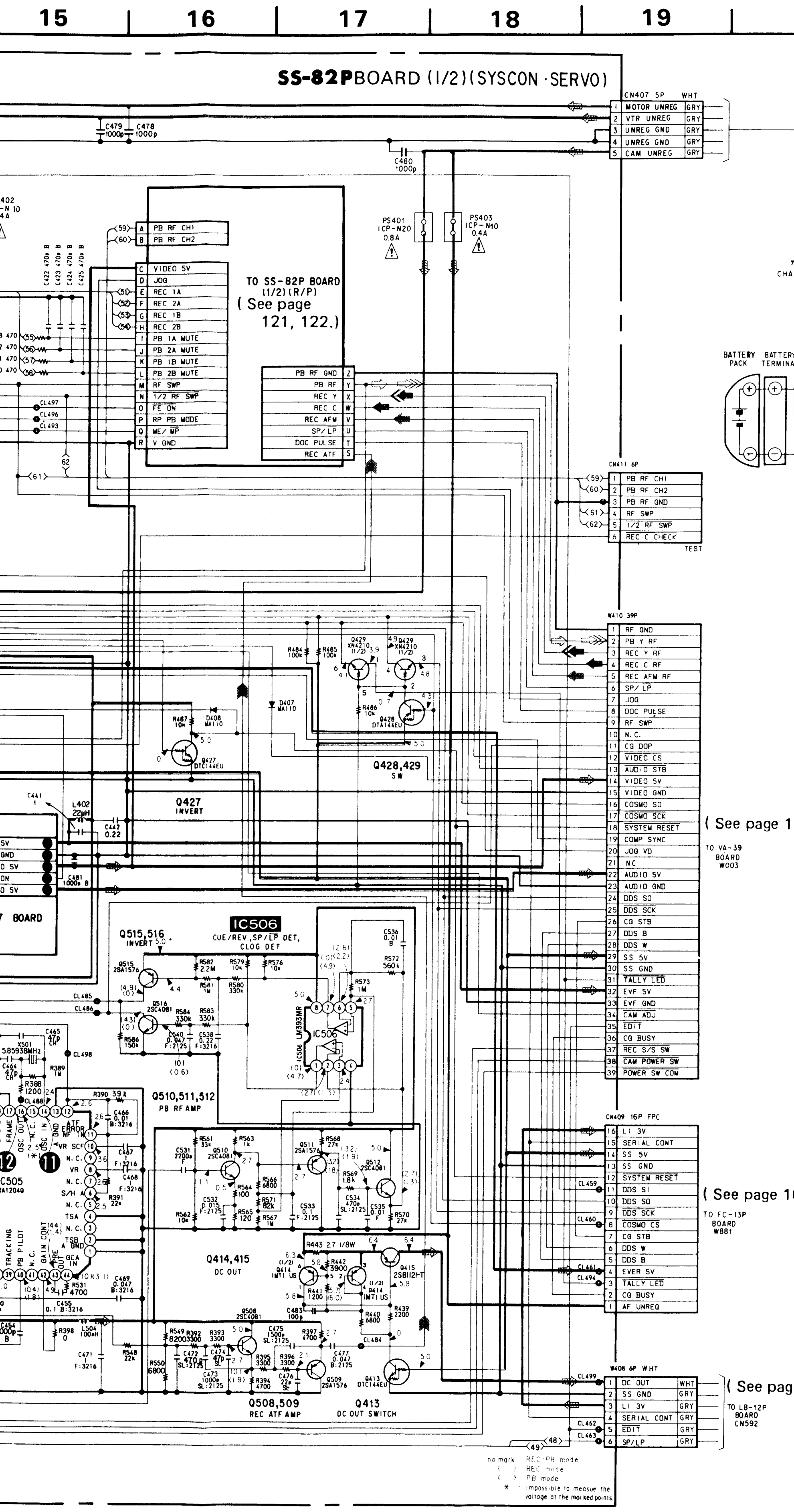
SERVO/SYSTEM CONTROL

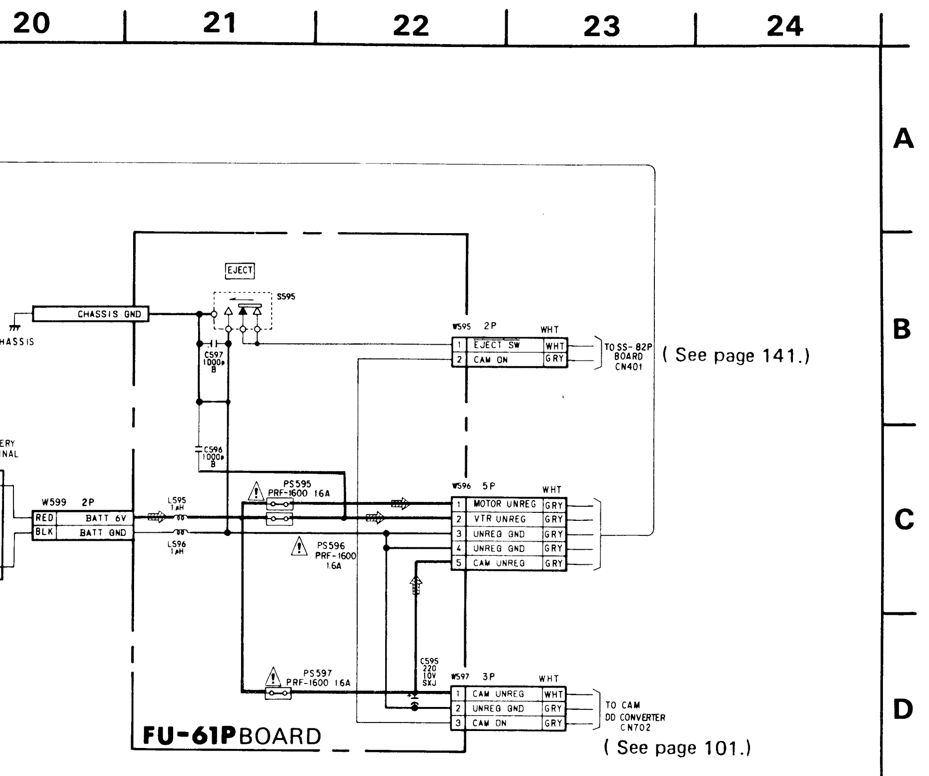
SS-82P, ST-27 (SERVO/SYSTEM CONTROL), DD-7 (SWITCHING REG, MOTOR DRIVER), FP-115 (TAPE T/E SENSE, TAPE SELECT), FU-61P (BATTERY HOLDER), FK-7P (MODE SWITCH) SCHEMATIC DIAGRAM

—Ref. No. SS-82P BOARD, ST-27 BOARD: 3,000 series, DD-7 BOARD: 4,000 series, FP-115 BOARD: 5,000 series, FU-61P BOARD: 6,000 series, FK-7P BOARD: 8,000 series—



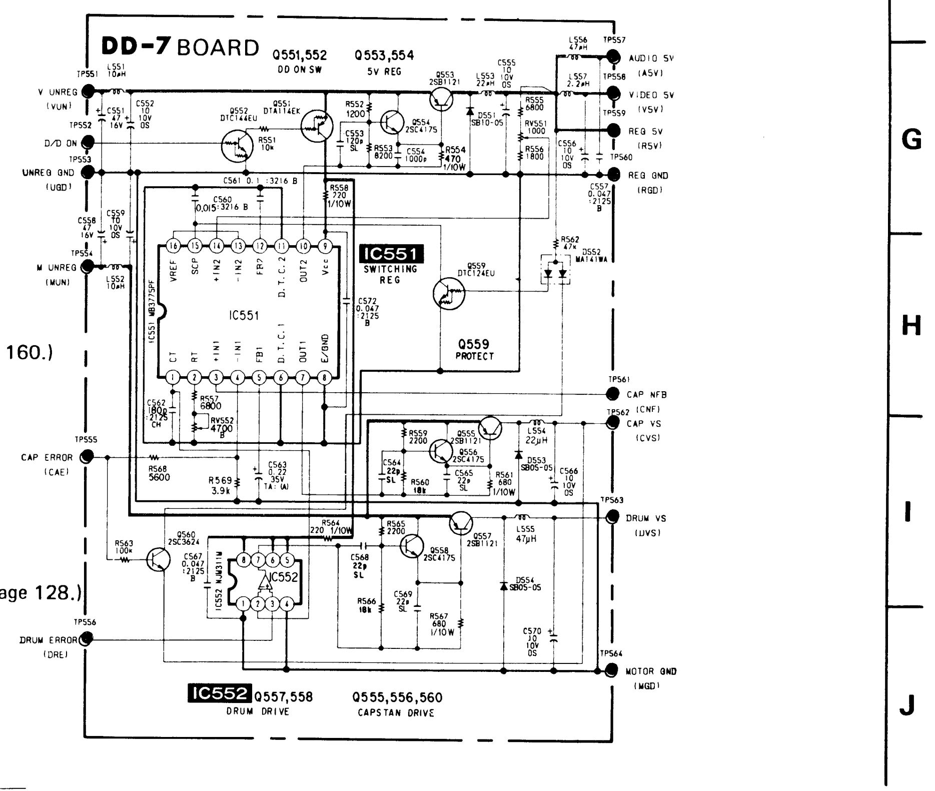
FK-7P BOARD
no mark VTR E-E mode
FP-115 BOARD
MECHA CHASSIS BLOCK
CAP
M902 CAP MOTOR
DRUM
M901 DRUM MOTOR
M903 LOADING MOTOR
DEW SENSOR
MODE SWITCH
CHASSIS
TO FU-61P BOARD W595
(See page 143.)
(See page 122.)
TO SS-82P BOARD CN311
ST-27 BOARD
IC402 REG
IC403 RESET
IC401 SYSTEM CONTROL, MAIN SERVO
IC401 CXP80116-0380 -0820 -1050
IC404 REEL FG AMP
Q417,418,419 DEW DET
Q411,412 WAKE UP
Q401
Q420 TAPE TOP DET
Q421 TAPE END DET
Q426 TAPE LED SW
IC405 L MOTOR DRIVE
Q435,436 LIM
IC406 CAPSTAN ERROR LPF
Q422,423 REG
Q424,425 CAM ON SW
IC501 DRUM M DRIVE
IC502 DRUM M DRIVE
IC503 WAVE SHAPER
IC504 CXA1127M CAPSTAN M DRIVE
Q501 COMP
Q524 CURR LIM DET
Q522,525,527 CURRENT LIM DET
Q502,503,504 REF LIMIT
Q506 PB RF BUFFER
IC505 ATF PROCESS
IC506 CUE/REV,SP/LP DET, CLOG DET
Q515,516 INVERT
Q510,511,512 PB RF AMP
Q414,415 DC OUT
Q508,509 REC ATF AMP
Q427 INVERT
TO DD-7 BOARD
TO SS-82P BOARD (1/2)(R/P) (See page 121, 122.)
SS-82P BOARD


15
16
17
18
19
SS-82P BOARD (1/2)(SYSCON·SERVO)
TO SS-82P BOARD (1/2)(R/P) (See page 121, 122.)
PS401 ICP-N20 0.8A
PS403 ICP-N40 0.4A
Q427 INVERT
Q428,429 SW
IC506 CUE/REV,SP/LP DET, CLOG DET
Q515,516 INVERT
Q510,511,512 PB RF AMP
Q414,415 DC OUT
Q508,509 REC ATF AMP
Q413 DC OUT SWITCH
(See page 128.)
TO VA-39 BOARD W003
(See page 160.)
TO FC-13P BOARD W881
(See page 128.)
TO LB-12P BOARD CN592
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
* : impossible to measure the voltage at the marked points


20
21
22
23
24
A
B
C
D
EJECT
CHASSIS GND
CHASSIS
BATTERY PACK
BATTERY TERMINAL
PS595 PRF-1600 16A
PS596 PRF-1600 16A
PS597 PRF-1600 16A
EJECT SW
CAM ON
TO SS-82P BOARD CN401
(See page 141.)
MOTOR UNREG
VTR UNREG
UNREG GND
CAM UNREG
TO CAM DD CONVERTER CN702
(See page 101.)
FU-61P BOARD

The resistors shown on the table below can adjust the picture quality according to their values. For details refer to the operation manual.

SP data	LP data	NAME	Function (R Mt:H/NO Mt:L)
Ⓕ R406	Ⓛ R412	ENC	● Edeg Noican ON/OFF
Ⓔ R405	Ⓚ R411	CFLL	● PB Y Comb Filter
Ⓓ R404	Ⓙ R410	CFLH	[DEPTH 0.5.8.10dB]
Ⓒ R403	Ⓘ R409	NCL2	● Noican DEPTH at 3MHz
Ⓑ R402	Ⓗ R408	NCL1	[0.4.5.2.6.7dB]
Ⓐ R401	Ⓖ R407	NCLP	● Noican LPF fg 7M/3M


G
H
I
J
DD-7 BOARD
Q551,552 DD ON SW
Q553,554 5V REG
IC551 SWITCHING REG
Q559 PROTECT
IC552
Q557,558 DRUM DRIVE
Q555,556,560 CAPSTAN DRIVE
V UNREG (VUN)
D/D ON
UNREG GND (UGD)
M UNREG (MUN)
CAP ERROR (CAE)
DRUM ERROR (DRE)
AUDIO 5V (ASV)
VIDEO 5V (VSV)
REG 5V (RSV)
REG GND (RGD)
CAP NFB (CNF)
CAP VS (CVS)
DRUM VS (DVS)
MOTOR GND (MGD)

- **Signal path**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo		⊐>	
Capstan phase servo	➡》	⊐》	⊐》
Capstan servo (speed and phase)		⊐》》	
Ref. signal	➡	⊐>	⊐>

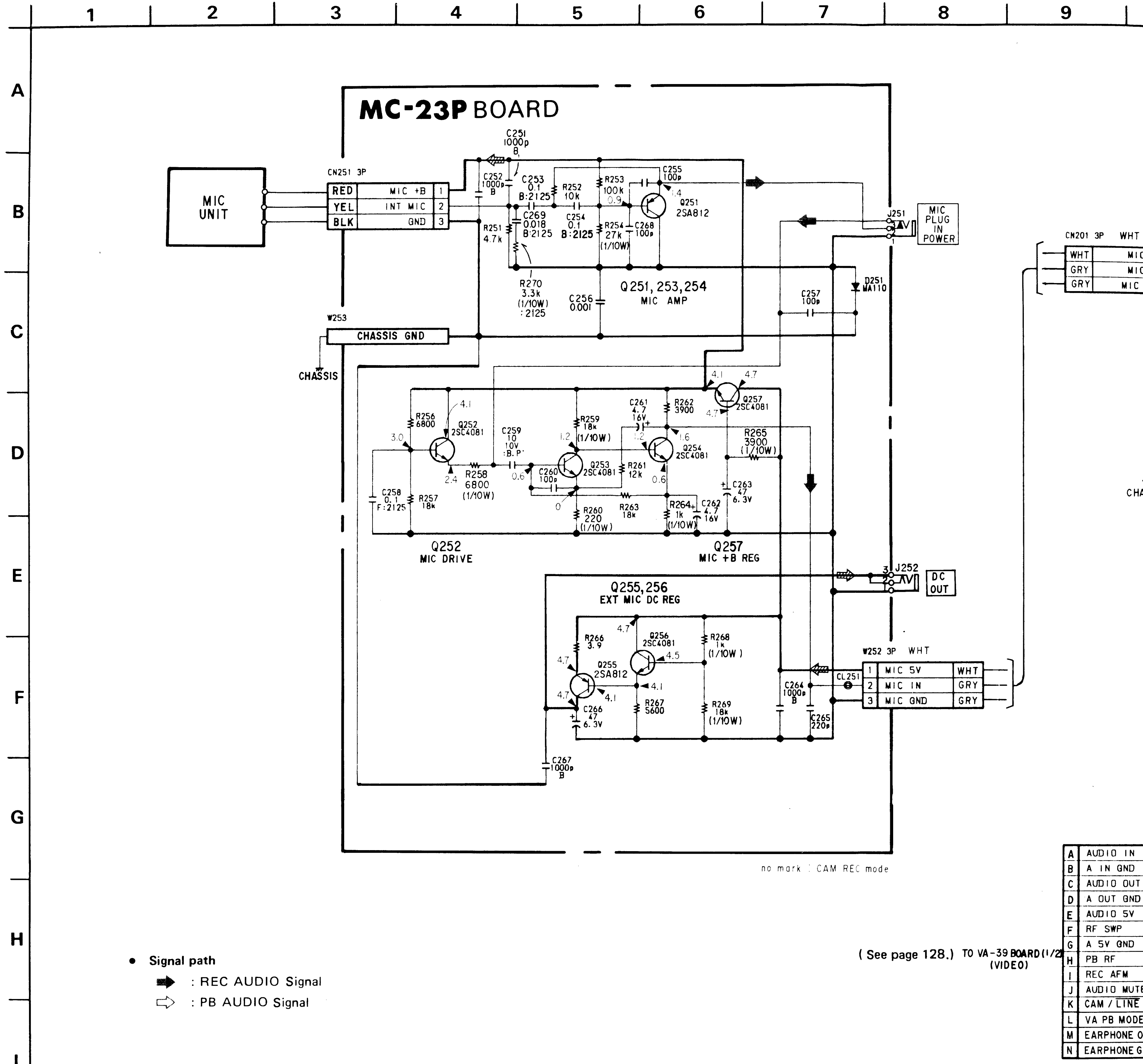
➡》 : REC Y Signal
➡ : REC CHROMA Signal
⇨》 : PB Y/CHROMA Signal
➡ : **REC AUDIO Signal**
⇨ : **PB AUDIO Signal**

- Caution for Handling SS-82P Board IC401

  SS-82P Board parts enclosed with ⬚ are not needed for IC401s which are identified with the number ending larger than -105Q.
  But, an IC401 product may be replaced with such IC401s even when it is provided with a part enclosed with ⬚.

VA-39 (AUDIO PROCESS), MC-23P (MIC AMP) SCHEMATIC DIAGRAM

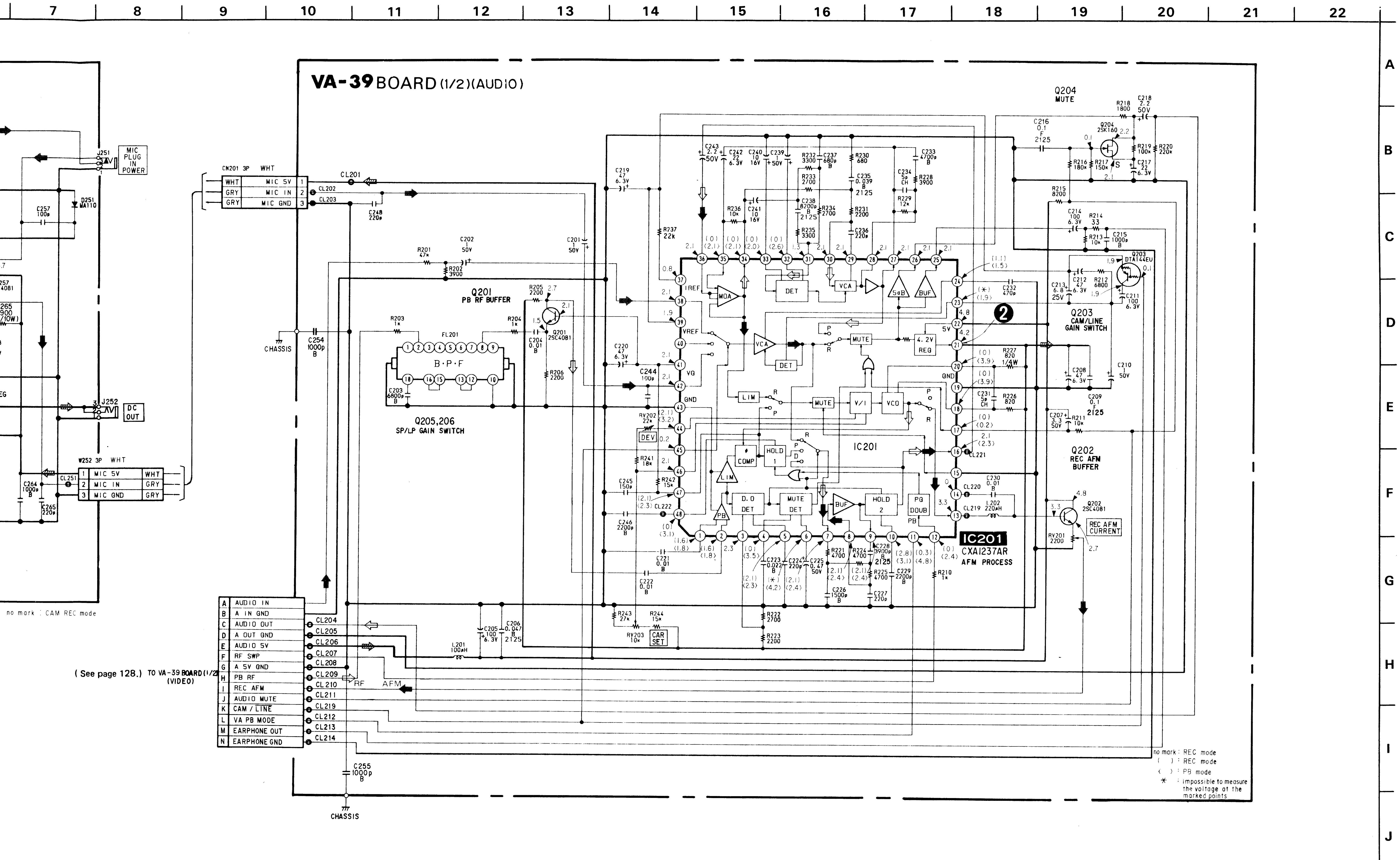
—Ref. No. VA-39 BOARD: 2,000 series, MC-23P BOARD: 4,000 series—


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
MC-23P BOARD
MIC UNIT
CN251 3P
RED MIC +B 1
YEL INT MIC 2
BLK GND 3
W253
CHASSIS GND
CHASSIS
C251 1000p B
C252 1000p B
C253 0.1 B:2125
R252 10k
R253 100k
C255 100p
Q251 2SA812
C269 0.018 B:2125
C254 0.1 B:2125
R254 27k (1/10W)
C268 100p
R251 4.7k
R270 3.3k (1/10W) :2125
C256 0.001
Q251, 253, 254 MIC AMP
J251
MIC PLUG IN POWER
D251 MA110
C257 100p
R256 6800
Q252 2SC4081
C259 10 10V :B.P
R259 18k (1/10W)
C261 4.7 16V
R262 3900
Q257 2SC4081
R265 3900 (1/10W)
Q254 2SC4081
Q253 2SC4081
C260 100p
R261 12k
R258 6800 (1/10W)
C258 0.1 F:2125
R257 18k
R260 220 (1/10W)
R263 18k
R264 1k (1/10W)
C262 4.7 16V
C263 47 6.3V
Q252 MIC DRIVE
Q257 MIC +B REG
J252
DC OUT
Q255, 256 EXT MIC DC REG
R266 3.9
Q256 2SC4081
R268 1k (1/10W)
Q255 2SA812
C266 47 6.3V
R267 5600
R269 18k (1/10W)
C264 1000p B
C265 220p
CL251
W252 3P WHT
1 MIC 5V WHT
2 MIC IN GRY
3 MIC GND GRY
C267 1000p B
CN201 3P WHT
WHT MIC
GRY MIC
GRY MIC
no mark : CAM REC mode
(See page 128.) TO VA-39 BOARD (1/2) (VIDEO)
A AUDIO IN
B A IN GND
C AUDIO OUT
D A OUT GND
E AUDIO 5V
F RF SWP
G A 5V GND
H PB RF
I REC AFM
J AUDIO MUTE
K CAM / LINE
L VA PB MODE
M EARPHONE O
N EARPHONE G

- Signal path

  ➡ : REC AUDIO Signal

  ⇨ : PB AUDIO Signal

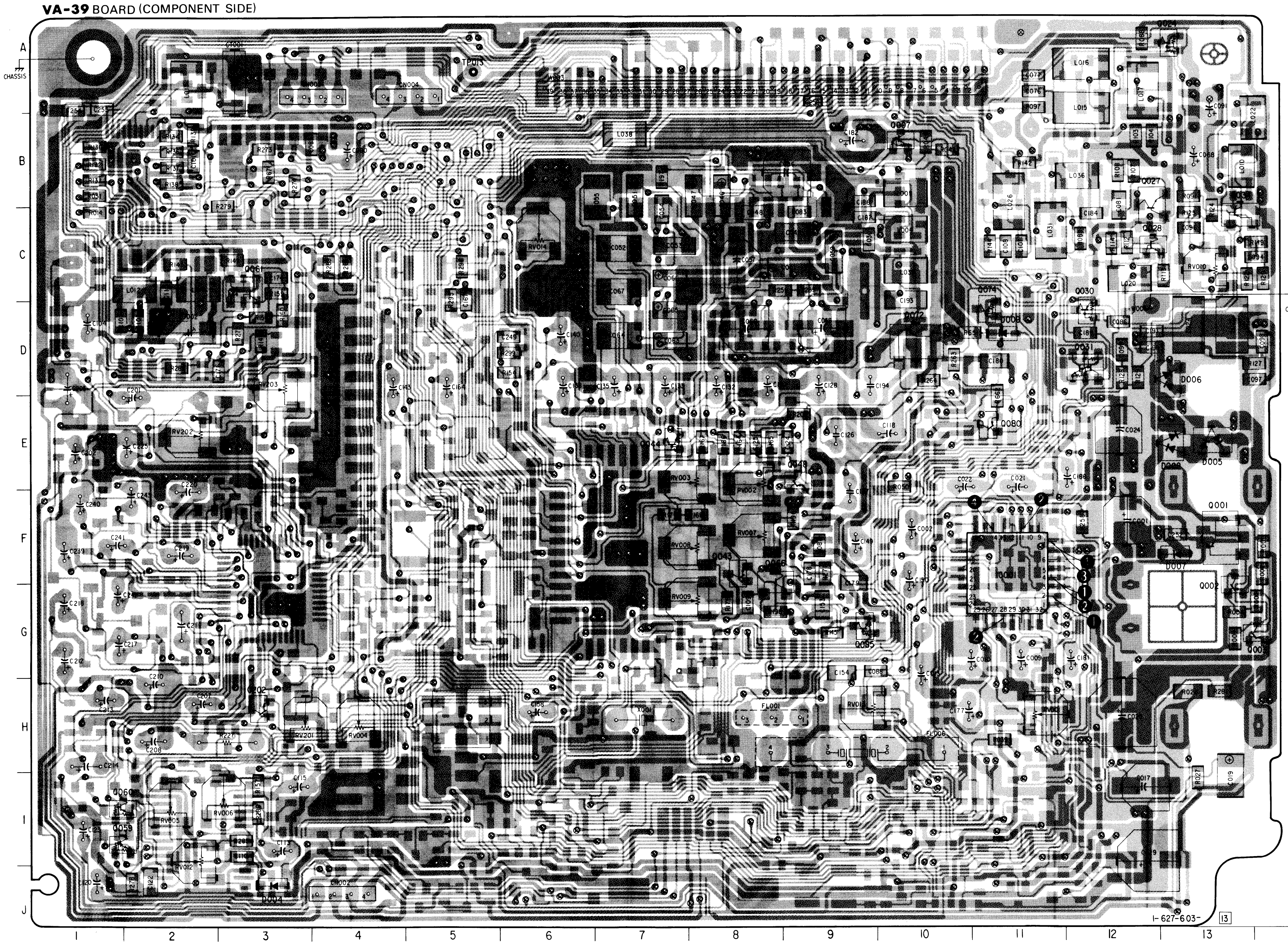

VA-39 BOARD (1/2)(AUDIO)
IC201
CXA1237AR
AFM PROCESS
Q201
PB RF BUFFER
Q202
REC AFM
BUFFER
Q203
CAM/LINE
GAIN SWITCH
Q204
MUTE
Q205,206
SP/LP GAIN SWITCH
FL201
B·P·F
MIC PLUG IN POWER
DC OUT
CN201 3P WHT
W252 3P WHT
MIC 5V
MIC IN
MIC GND
CHASSIS
REC AFM CURRENT
CAR SET
DEV
A AUDIO IN
B A IN GND
C AUDIO OUT
D A OUT GND
E AUDIO 5V
F RF SWP
G A 5V GND
H PB RF
I REC AFM
J AUDIO MUTE
K CAM / LINE
L VA PB MODE
M EARPHONE OUT
N EARPHONE GND
(See page 128.) TO VA-39 BOARD (1/2) (VIDEO)
RF
AFM
no mark : CAM REC mode
no mark : REC mode
( ) : REC mode
⟨ ⟩ : PB mode
* : impossible to measure the voltage at the marked points
MOA
DET
VCA
5dB
BUF
MUTE
4.2V REG
LIM
V/I
VCO
COMP
HOLD 1
D.O DET
MUTE DET
HOLD 2
PG DOUB
PB
IREF
VREF
VG
GND
5V
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J

VA-39 (AUDIO PROCESS), MC-23P (MIC AMP) PRINTED WIRING BOARDS

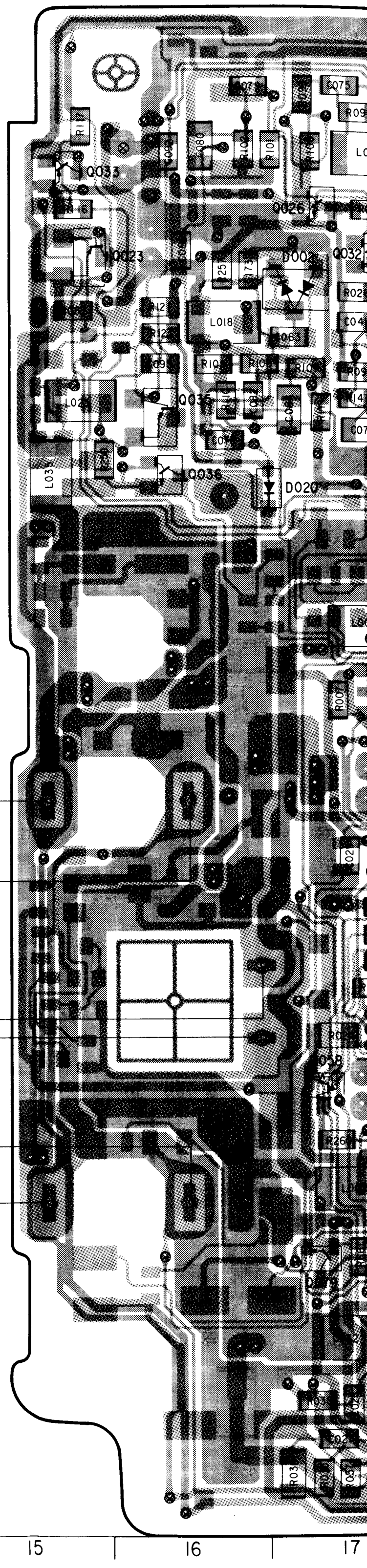
—Ref. No. VA-39 BOARD: 2,000 series, MC-23P BOARD: 4,000 series—

CN001	I-21
CN002	J-4
CN004	A-4
CN005	A-3
CN021	C-28
CT001	A-3
CT002	D-2
D001	I-22
D002	B-17
D003	A-26
D004	J-3
D005	E-13
D006	D-13
D007	F-13
D008	E-13
D009	D-11
D010	G-24
D011	I-28
D020	D-16
IC001	F-11
IC002	C-20
IC003	F-21
IC004	G-19
IC005	D-18
IC006	D-26
IC007	I-26
IC008	B-25
IC009	B-27
IC201	G-26
Q001	F-13
Q002	G-13
Q003	G-13
Q004	E-17
Q005	F-18
Q006	J-19
Q007	B-10
Q008	C-19
Q009	C-18
Q010	H-17
Q011	J-17
Q012	J-18
Q013	I-17
Q014	I-18
Q015	I-22
Q016	I-22
Q017	I-20
Q018	I-20
Q019	I-20
Q020	I-23
Q021	I-19
Q022	I-19
Q023	B-15
Q024	A-12
Q025	G-18
Q026	B-17
Q027	B-12
Q028	C-12
Q030	D-12
Q031	D-12
Q032	B-17
Q033	B-15
Q034	C-13
Q035	C-16
Q036	C-16
Q037	H-24
Q038	I-27
Q039	H-22
Q040	G-17
Q041	B-18
Q042	F-24
Q043	F-8
Q044	E-7
Q045	C-23
Q046	C-24
Q047	D-24
Q048	E-9
Q049	F-24
Q050	F-23
Q051	G-18
Q052	F-17
Q054	D-24
Q056	D-24
Q058	G-17
Q059	I-1
Q060	I-1
Q061	C-3
Q062	I-27
Q063	H-26
Q064	F-23
Q065	C-17
Q066	F-8
Q067	C-25
Q068	H-25
Q070	D-23
Q071	B-19
Q072	D-10
Q073	H-26
Q074	D-11
Q075	I-25
Q076	I-24
Q077	J-24
Q078	J-24
Q079	H-17
Q080	E-11
Q081	E-19
Q082	E-19
Q083	D-23
Q085	G-9
Q086	E-24
Q201	F-25
Q202	H-3
Q203	G-26
Q204	G-27
RV001	H-11
RV002	E-8
RV003	E-7
RV004	H-4
RV005	I-2
RV006	I-2
RV007	F-8
RV008	F-7
RV009	G-7
RV010	C-13
RV012	I-2
RV013	H-9
RV014	C-6
RV201	H-3
RV202	E-2
RV203	D-3
TP013	A-5
W003	A-8
W006	D-12

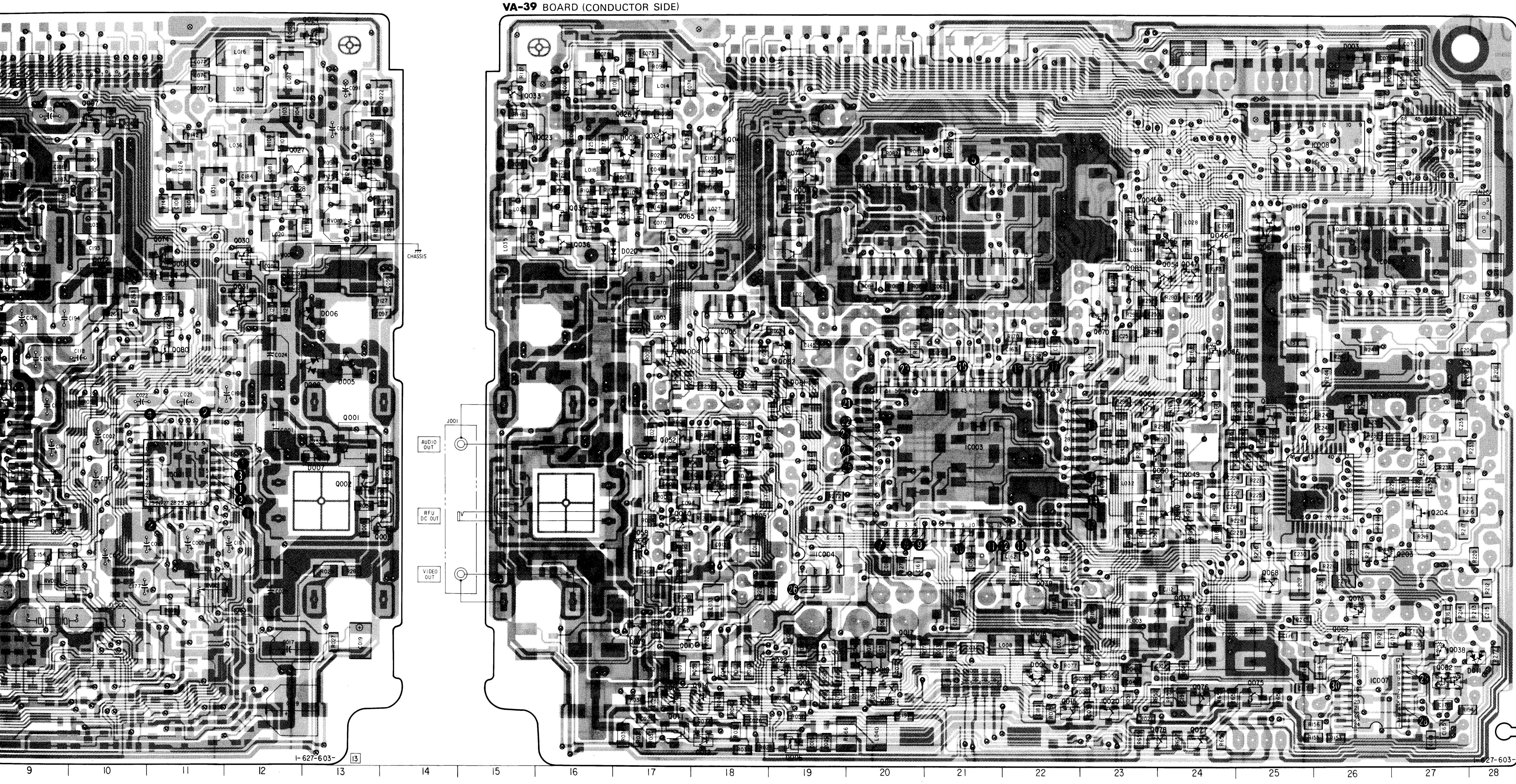
VA-39 BOARD (COMPONENT SIDE)

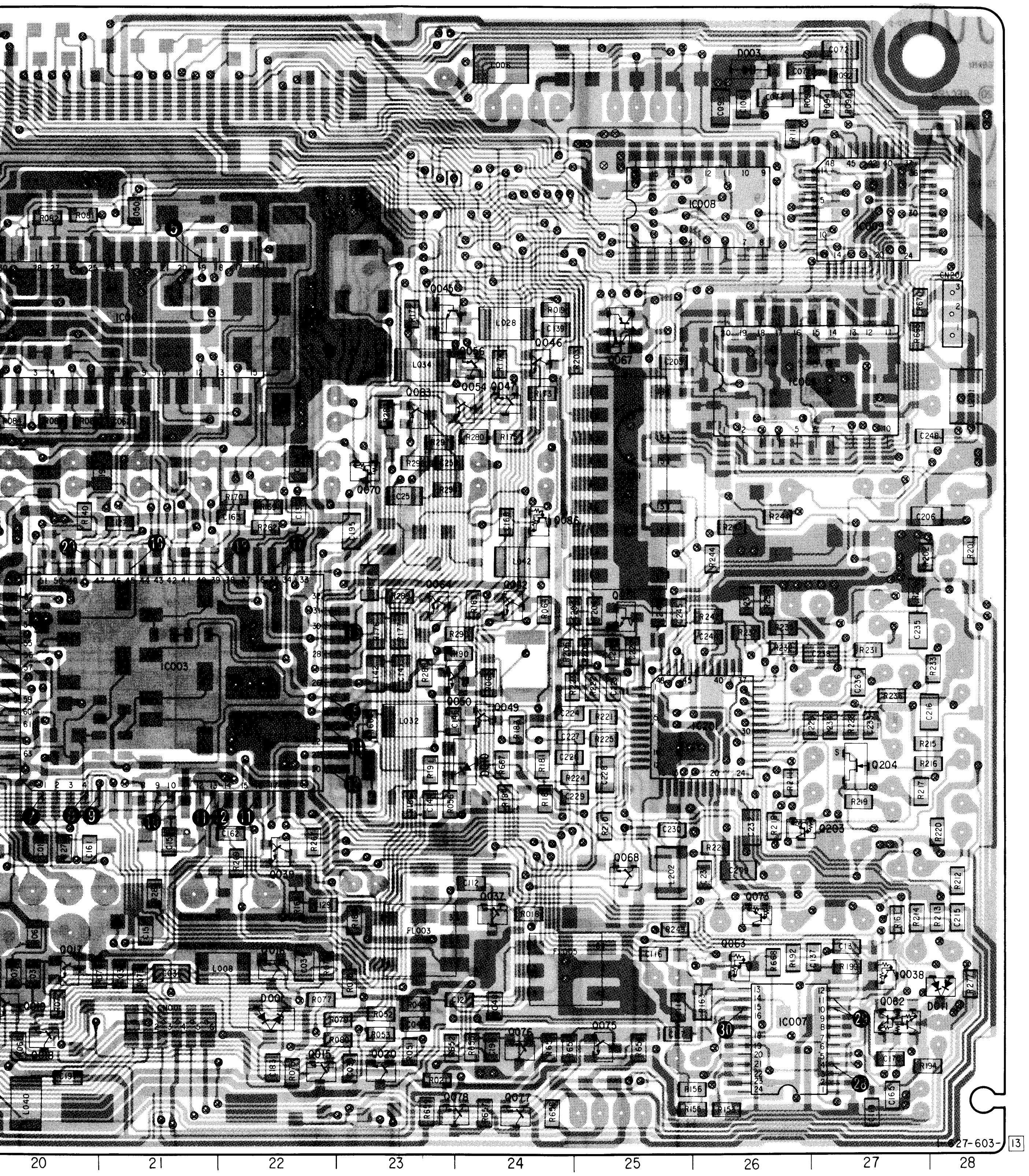


VA-39 BOARD (CONDUCTOR SI

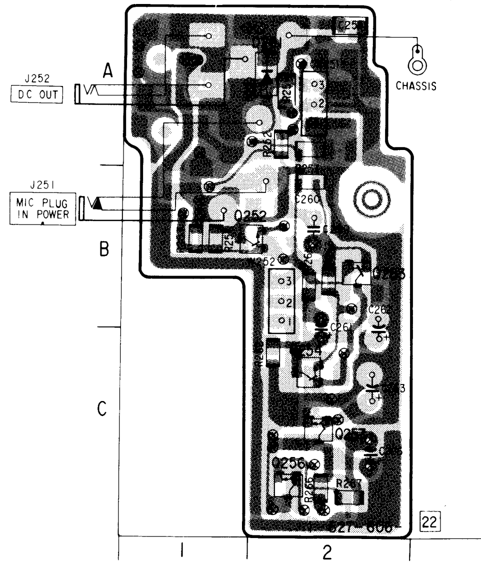


VA-39 BOARD (CONDUCTOR SIDE)

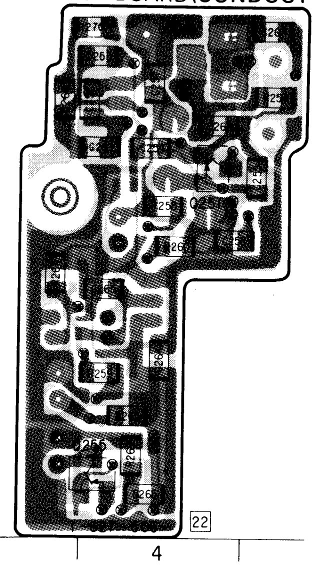

J001
AUDIO OUT
RFU DC OUT
VIDEO OUT
CHASSIS
IC001
IC003
IC004
IC005
IC007
IC008
1-627-603-
13
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28


IC008
IC003
IC007
D003
L028
L034
L032
L042
FL003
L008
Q046
Q054
Q067
Q070
Q050
Q049
Q068
Q063
Q038
Q082
Q076
Q075
Q020
Q015
Q204
Q203
D001
D011
C248
C206
C235
C236
C230
R244
R231
R249
27-603- 13
20
21
22
23
24
25
26
27
28

MC-23P BOARD(COMPONENT SIDE)


A
B
C
J252
DC OUT
J251
MIC PLUG IN POWER
CHASSIS
C260
C261
Q252
W252
Q257
Q256
R265
R267
27-606
22
1
2
3

MC-23P BOARD(CONDUCTOR SIDE)

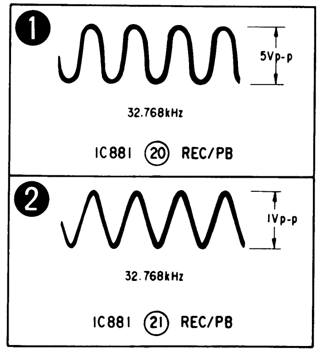

Q251
Q255
22
4

CN251	A-2
D251	A-1
Q251	B-4
Q252	B-1
Q253	B-2
Q254	C-2
Q255	C-3
Q256	C-2
Q257	C-2
W252	B-1
W253	A-2

FC-13P (MODE CONTROL) PRINTED WIRING BOARD

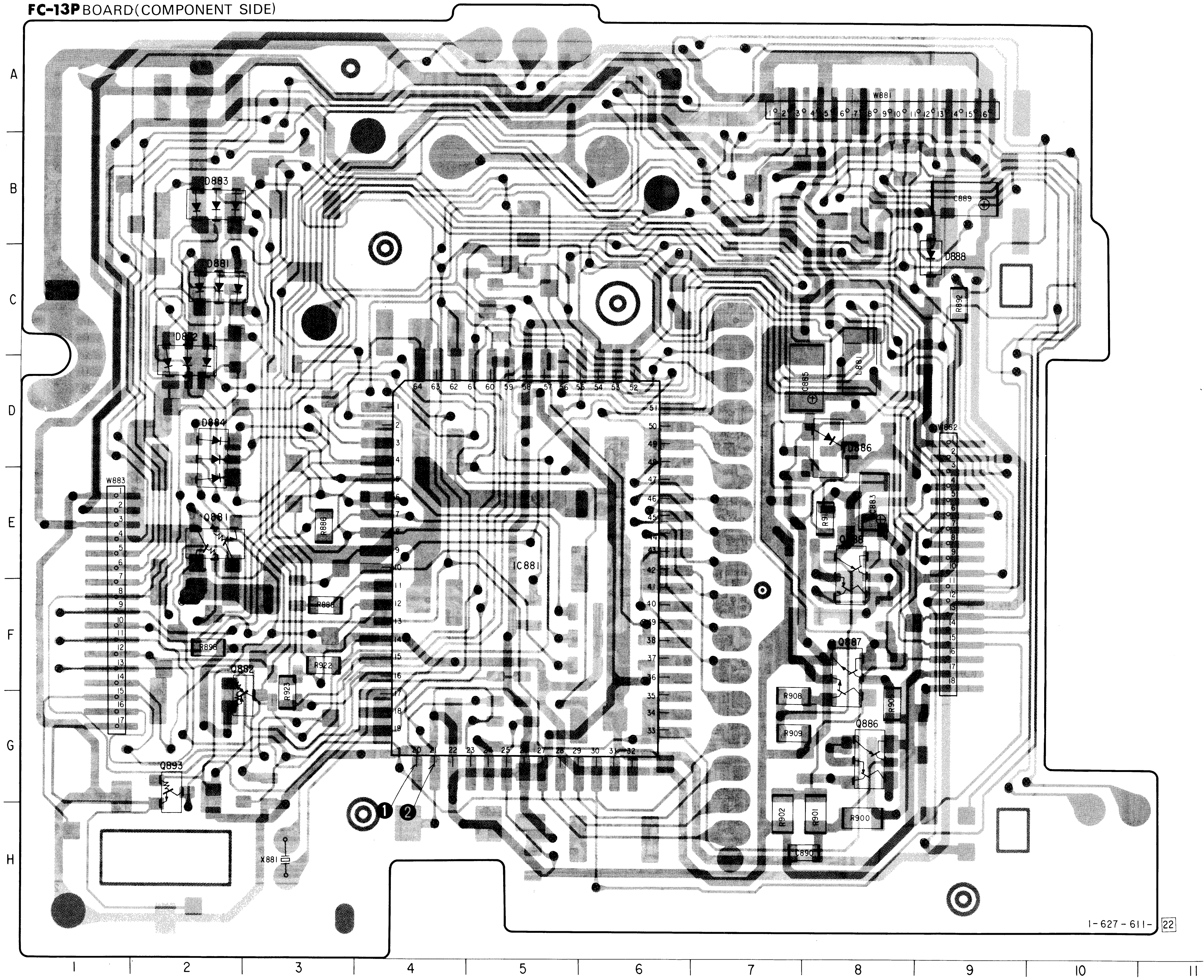
—Ref. No. FC-13P BOARD: 5,000 series—

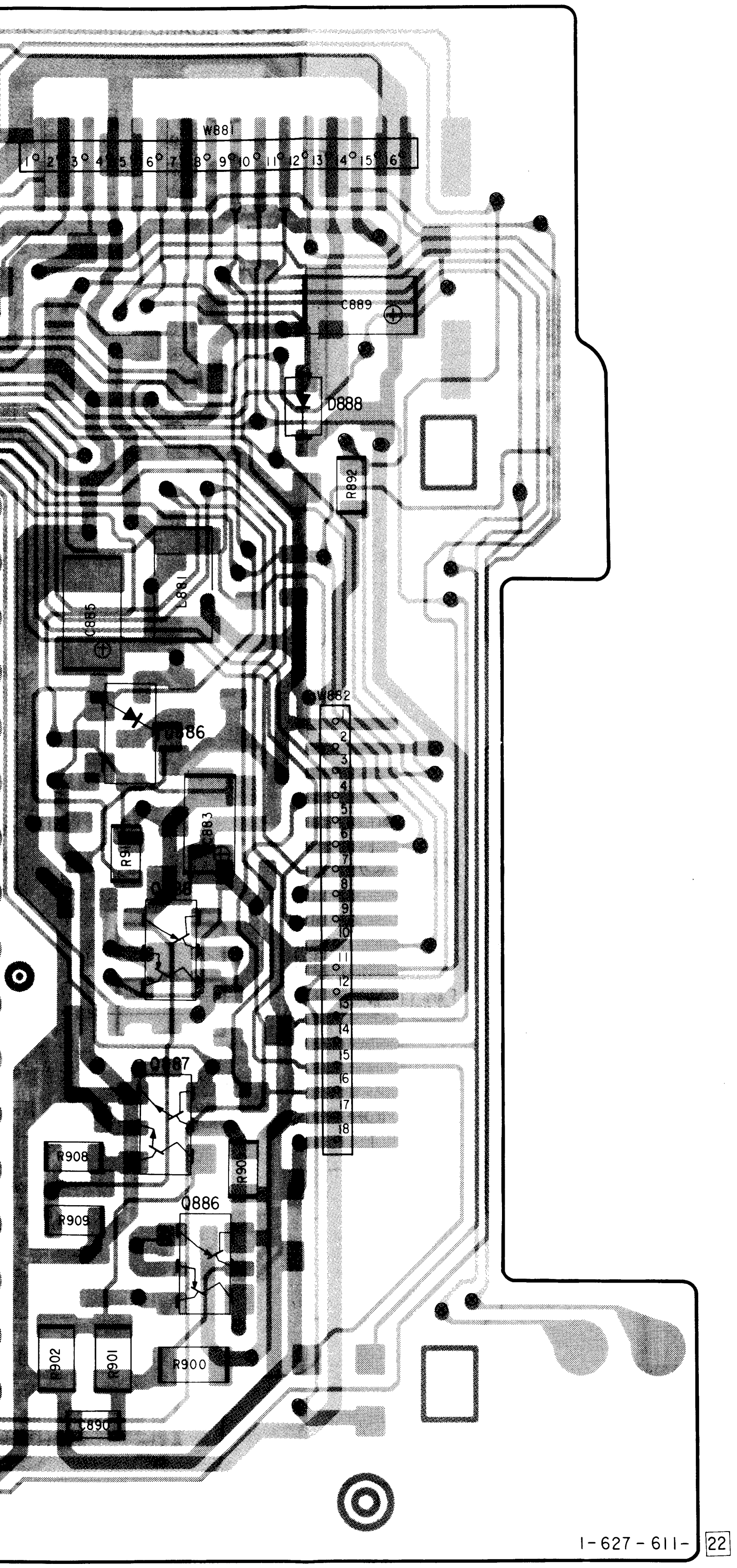
FC-13P BOARD



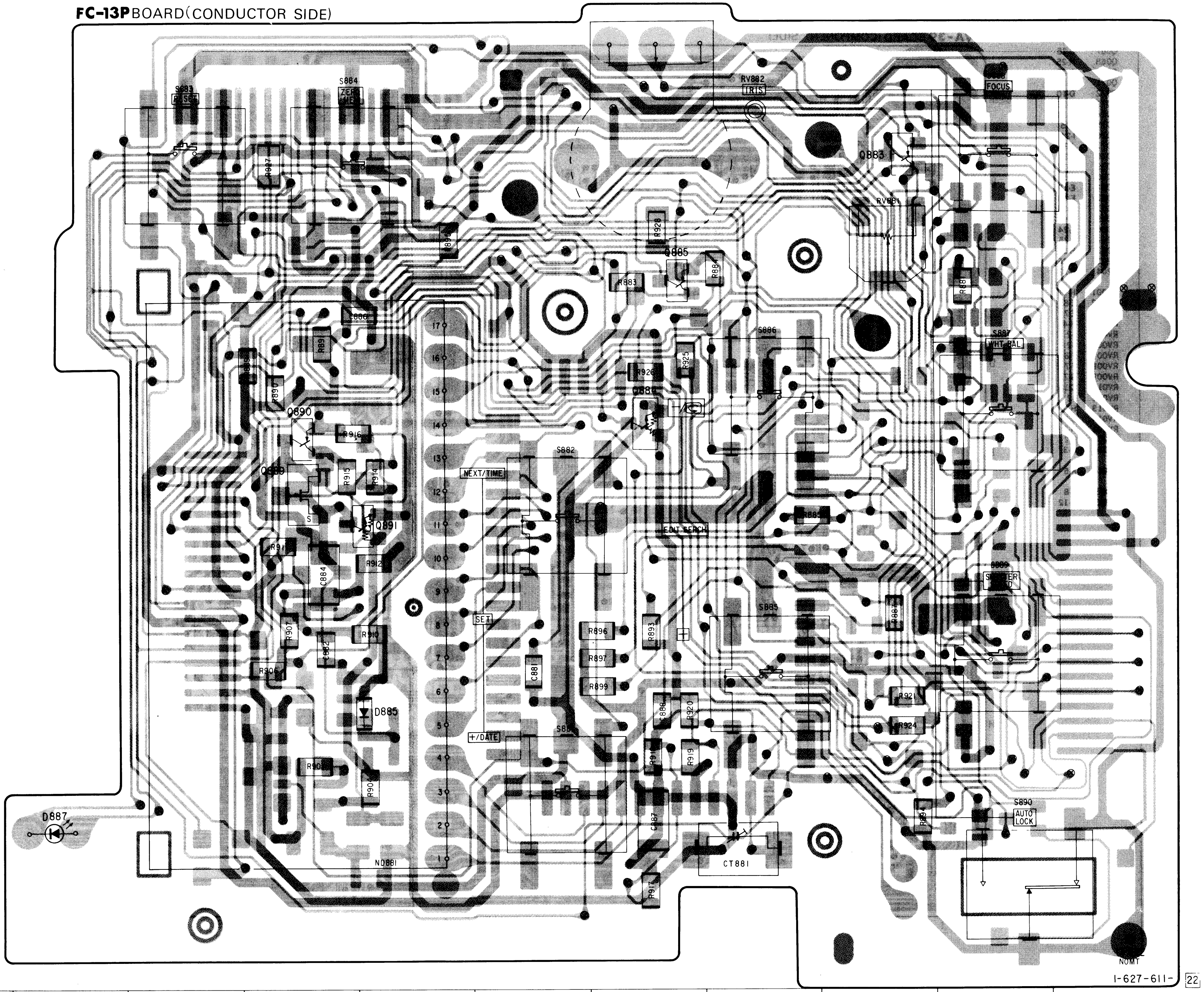
CT881	H-18
D881	C-2
D882	C-2
D883	B-2
D884	D-2
D885	F-15
D886	D-8
D887	G-12
D888	C-9
IC881	E-5
Q881	E-2
Q882	F-2
Q883	B-19
Q884	D-17
Q885	C-17
Q886	G-8
Q887	F-8
Q888	E-8
Q889	D-14
Q890	D-14
Q891	E-15
Q893	G-2
RV881	B-19
RV882	A-18
W881	A-8
W882	D-9
W883	E-1

FC-13P BOARD(COMPONENT SIDE)


A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
W881
D883
D881
D882
D884
Q881
W883
R886
R898
Q882
R923
R922
Q893
X881
IC881
❶
❷
C889
D888
R892
Q885
L881
D886
W882
R91
C883
Q887
R908
R909
R90
Q886
R902
R901
R900
C890
1-627-611- 22


W881
C889
D888
R892
Q885
L881
Q886
W882
Q883
Q887
R908
R909
Q886
R902
R901
R900
C890
1-627-611- 22

FC-13P BOARD(CONDUCTOR SIDE)


S883 RESET
S884 ZERO
RV882 IRIS
FOCUS
Q883
RV881
R928
Q886
R883
R884
R881
S886
S887 WHT BAL
R926
R925
Q888
Q890
R916
Q889
R915
R914
Q891
NEXT/TIME
S882
EDIT SERCH
R885
R911
C884
R912
Q889
SHUTTER SPEED
S885
R907
C882
R910
R896
R897
R899
C881
R893
SET
R887
R921
R924
R905
D885
+/DATE
R888
R920
R919
R918
R906
R904
S890 AUTO LOCK
R894
D887
C887
CT881
R917
ND881
NOMT
1-627-611- 22

7
8
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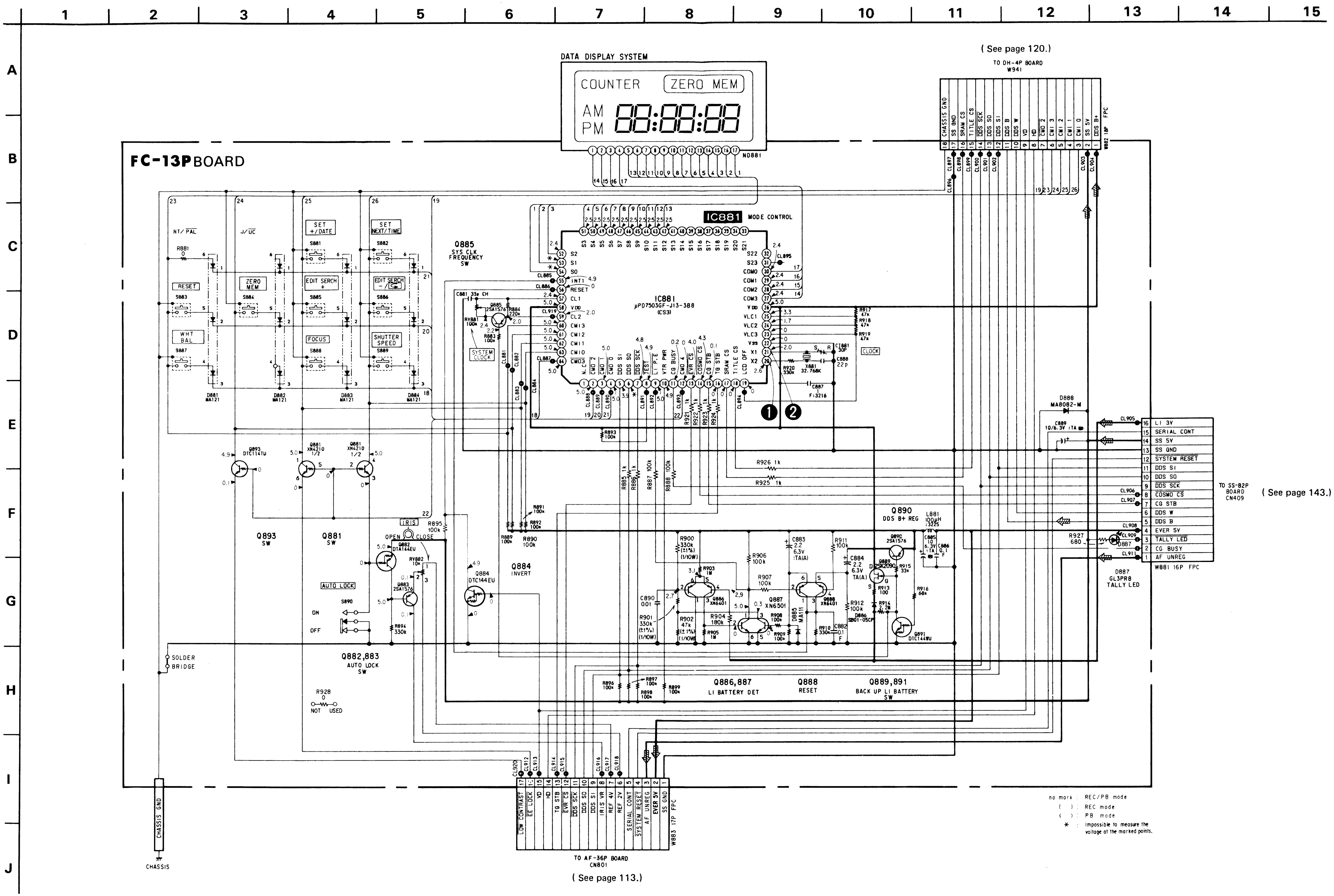
12
13
14
15
16
17
18
19
20
21

FC-13P (MODE CONTROL) SCHEMATIC DIAGRAM

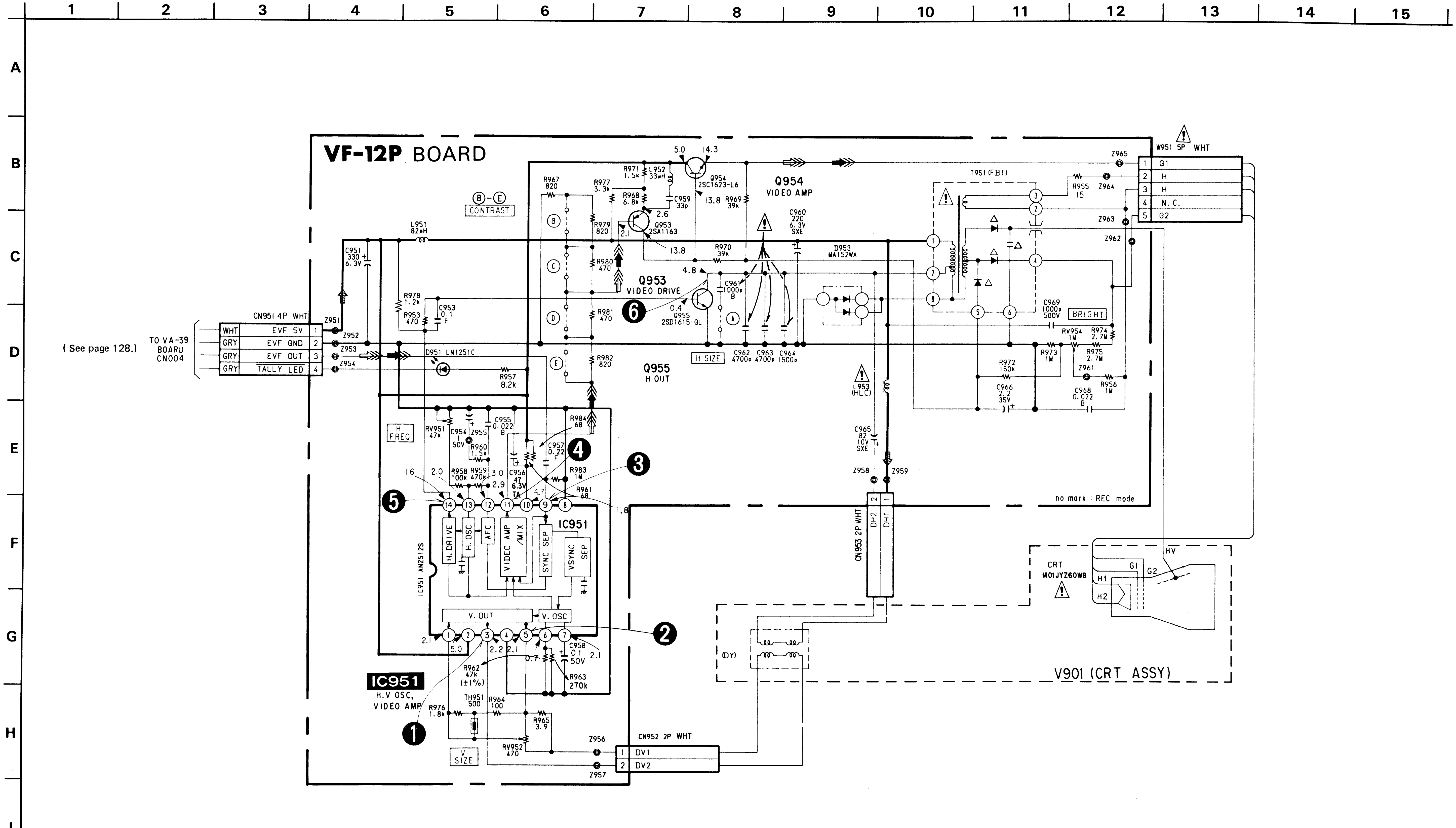
—Ref. No. FC-13P BOARD: 5,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
DATA DISPLAY SYSTEM
COUNTER
ZERO MEM
AM
PM
ND881
FC-13P BOARD
IC881 MODE CONTROL
IC881
μPD7503GF-J13-388
(CS3)
(See page 120.)
TO DH-4P BOARD
W941
CHASSIS GND
SS GND
SRAM CS
TITLE CS
DDS SCK
DDS SO
DDS SI
DDS B
DDS W
VD
HD
CMO 2
CMI 3
CMI 2
CMI 1
CMI 0
SS 5V
DDS B+
W882 18P FPC
NT/PAL
J/UC
SET +/DATE
SET NEXT/TIME
RESET
ZERO MEM
EDIT SERCH +
EDIT SERCH −
WHT BAL
FOCUS
SHUTTER SPEED
S881
S882
S883
S884
S885
S886
S887
S888
S889
D881 MA121
D882 MA121
D883 MA121
D884 MA121
Q885
SYS CLK FREQUENCY SW
SYSTEM CLOCK
CLOCK
X881 32.768K
D888 MA8082-M
TO SS-82P BOARD CN409
(See page 143.)
LI 3V
SERIAL CONT
SS 5V
SS GND
SYSTEM RESET
DDS SI
DDS SO
DDS SCK
COSMO CS
CG STB
DDS W
DDS B
EVER 5V
TALLY LED
CG BUSY
AF UNREG
W881 16P FPC
D887 GL3PR8 TALLY LED
Q893 DTC114TU
Q881 XN4210
Q893 SW
Q881 SW
IRIS
OPEN
CLOSE
Q882 DTA144EU
Q883 2SA1576
AUTO LOCK
S890
ON
OFF
Q882,883 AUTO LOCK SW
Q884 DTC144EU
Q884 INVERT
Q890 DDS B+ REG
Q886 XN6401
Q887 XN6501
Q888 XN6401
Q889 2SK2090
Q890 2SA1576
Q891 DTC144TU
D885 MA111
D886 SB01-05CP
Q886,887 LI BATTERY DET
Q888 RESET
Q889,891 BACK UP LI BATTERY SW
SOLDER BRIDGE
R928 0 NOT USED
CHASSIS GND
CHASSIS
LOW CONTRAST
EE LOCK
VD
HD
TG STB
EVR CS
DDS SCK
DDS SO
DDS SI
IRIS VR
REF 4V
REF 2V
SERIAL CONT
SYSTEM RESET
AF UNREG
EVER 5V
SS GND
W883 17P FPC
TO AF-36P BOARD CN801
(See page 113.)
❶
❷

no mork : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
＊ : Impossible to measure the voltage at the marked points.

VF-12P (VIEWFINDER) SCHEMATIC DIAGRAM

—Ref. No. VF-12P BOARD: 6,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
VF-12P BOARD
(See page 128.)
TO VA-39 BOARD CN004
CN951 4P WHT
WHT EVF 5V 1
GRY EVF GND 2
GRY EVF OUT 3
GRY TALLY LED 4
Z951
Z952
Z953
Z954
C951 330 6.3V
L951 82μH
R978 1.2k
R953 470
C953 0.1 F
D951 LN1251C
R957 8.2k
B-E CONTRAST
R967 820
R977 3.3k
R971 1.5k
L952 33μH
R968 6.8k
R979 820
R980 470
R981 470
R982 820
Q953 2SA1163
C959 33p
Q954 2SC1623-L6
Q954 VIDEO AMP
R969 39k
Q953 VIDEO DRIVE
Q955 2SD1615-GL
Q955 H OUT
R970 39k
C961 1000p B
C960 220 6.3V SXE
D953 MA152WA
H SIZE
C962 4700p
C963 4700p
C964 1500p
T951 (FBT)
R955 15
Z964
Z965
Z963
Z962
C969 1000p 500V
BRIGHT
RV954 1M
R974 2.7M
R973 1M
R975 2.7M
R972 150k
Z961
R956 1M
C966 2.2 35V
C968 0.022 B
L953 (HLC)
C965 82 10V SXE
Z958
Z959
W951 5P WHT
1 G1
2 H
3 H
4 N.C.
5 G2
no mark : REC mode
CN953 2P WHT
DH2
DH1
CRT M01JYZ60WB
HV
G1
G2
H1
H2
(DY)
V901 (CRT ASSY)
H FREQ
RV951 47k
C954 1 50V
Z955
R960 1.5k
C955 0.022 B
R984 68
C957 0.22 F
R958 100k
R959 470k
C956 47 6.3V TA
R983 1M
R961 68
IC951
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V. OUT
V. OSC
IC951 AN2512S
C958 0.1 50V
R962 47k (±1%)
R963 270k
IC951
H.V OSC, VIDEO AMP
R976 1.8k
TH951 500
R964 100
R965 3.9
RV952 470
V SIZE
Z956
Z957
CN952 2P WHT
1 DV1
2 DV2
1
2
3
4
5
6

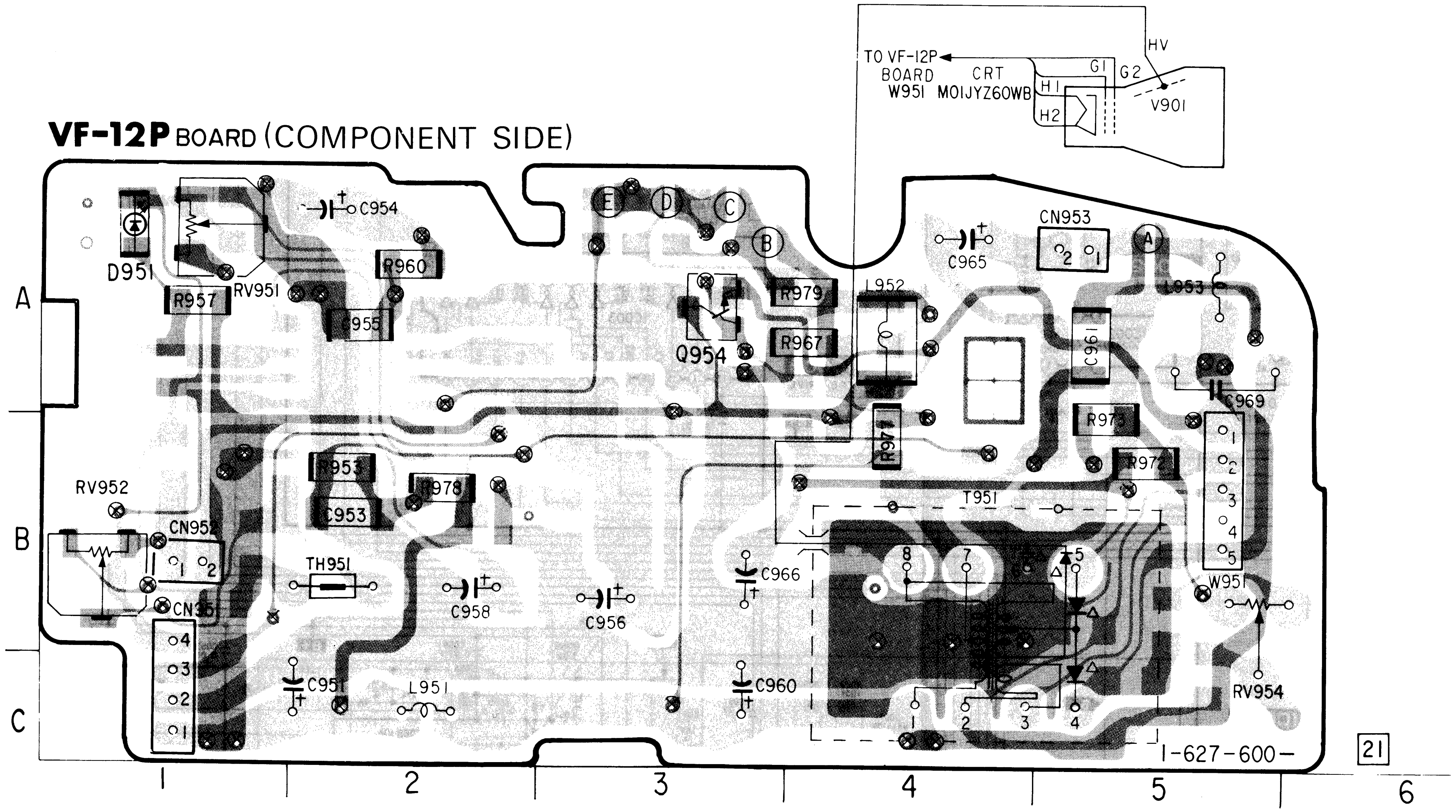
- **Signal path**

➡≫ : REC Y/CHROMA Signal
⇨≫ : PB Y/CHROMA Signal

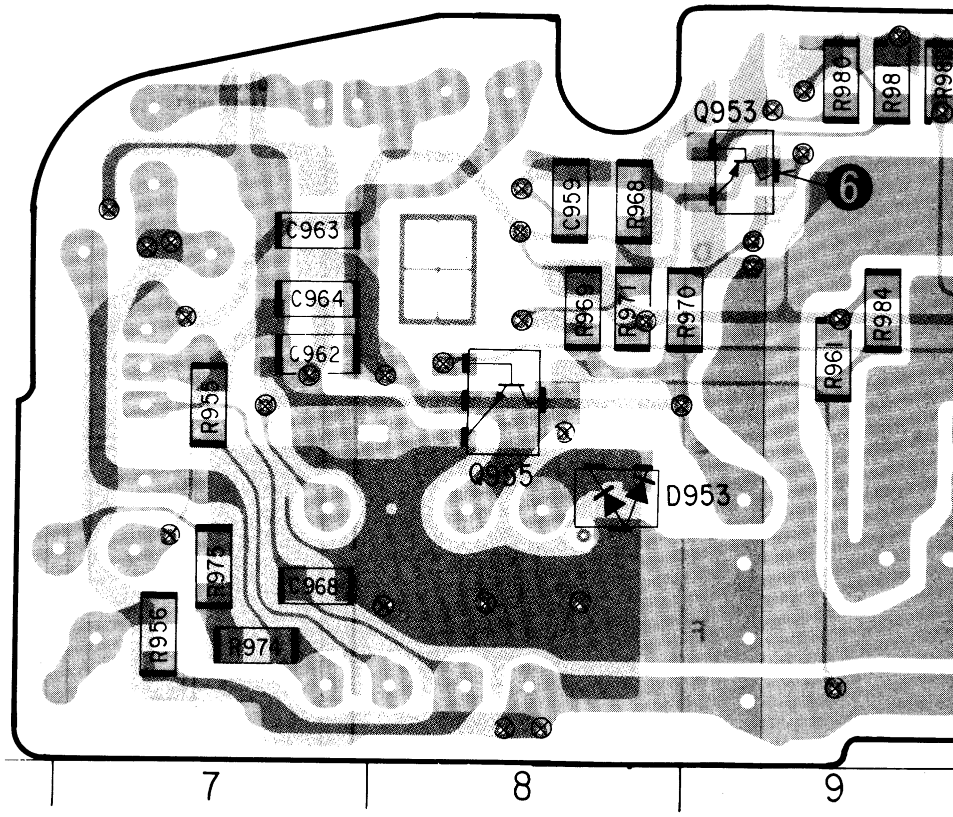
VF-12P (VIEWFINDER) PRINTED WIRING BOARD
—Ref. No. VF-12P BOARD: 6,000 series—

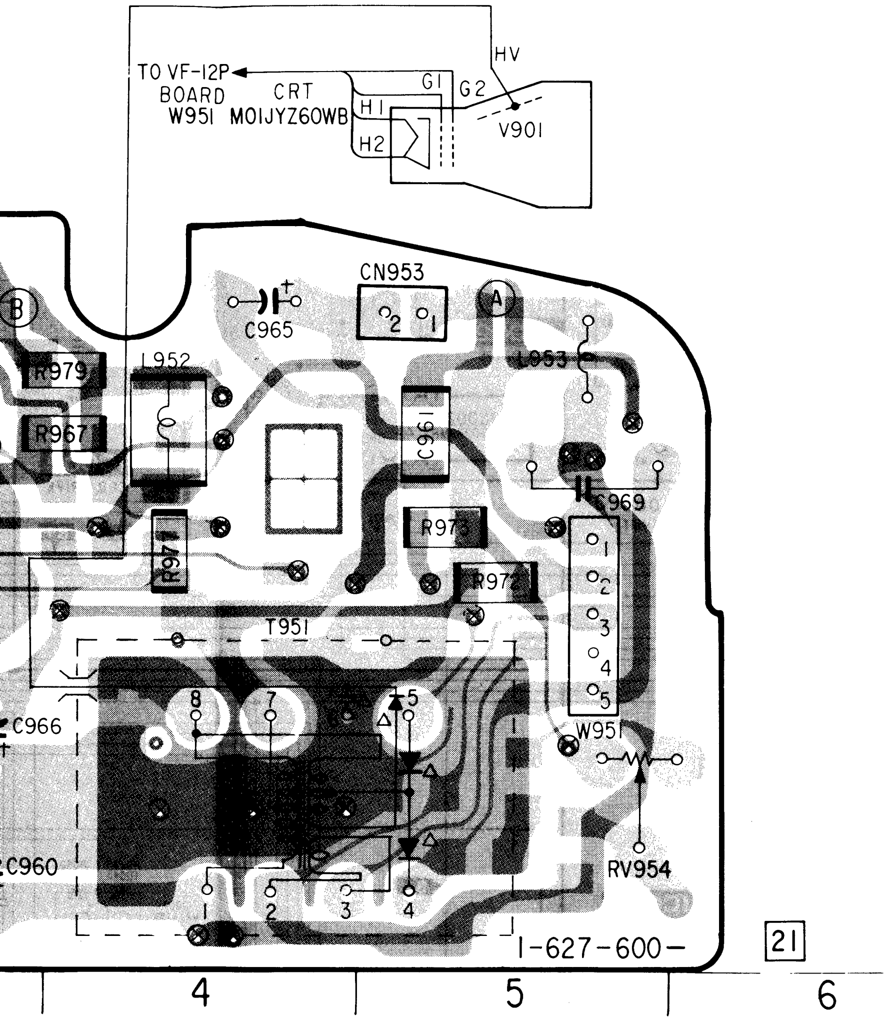
CN951	C-1
CN952	B-1
CN953	A-5
D951	A-1
D953	B-8
IC951	B-10
Q953	A-9
Q954	A-3
Q955	B-8
RV951	A-1
RV952	B-1
RV954	B-5
W951	B-5

VF-12P BOARD (COMPONENT SIDE)

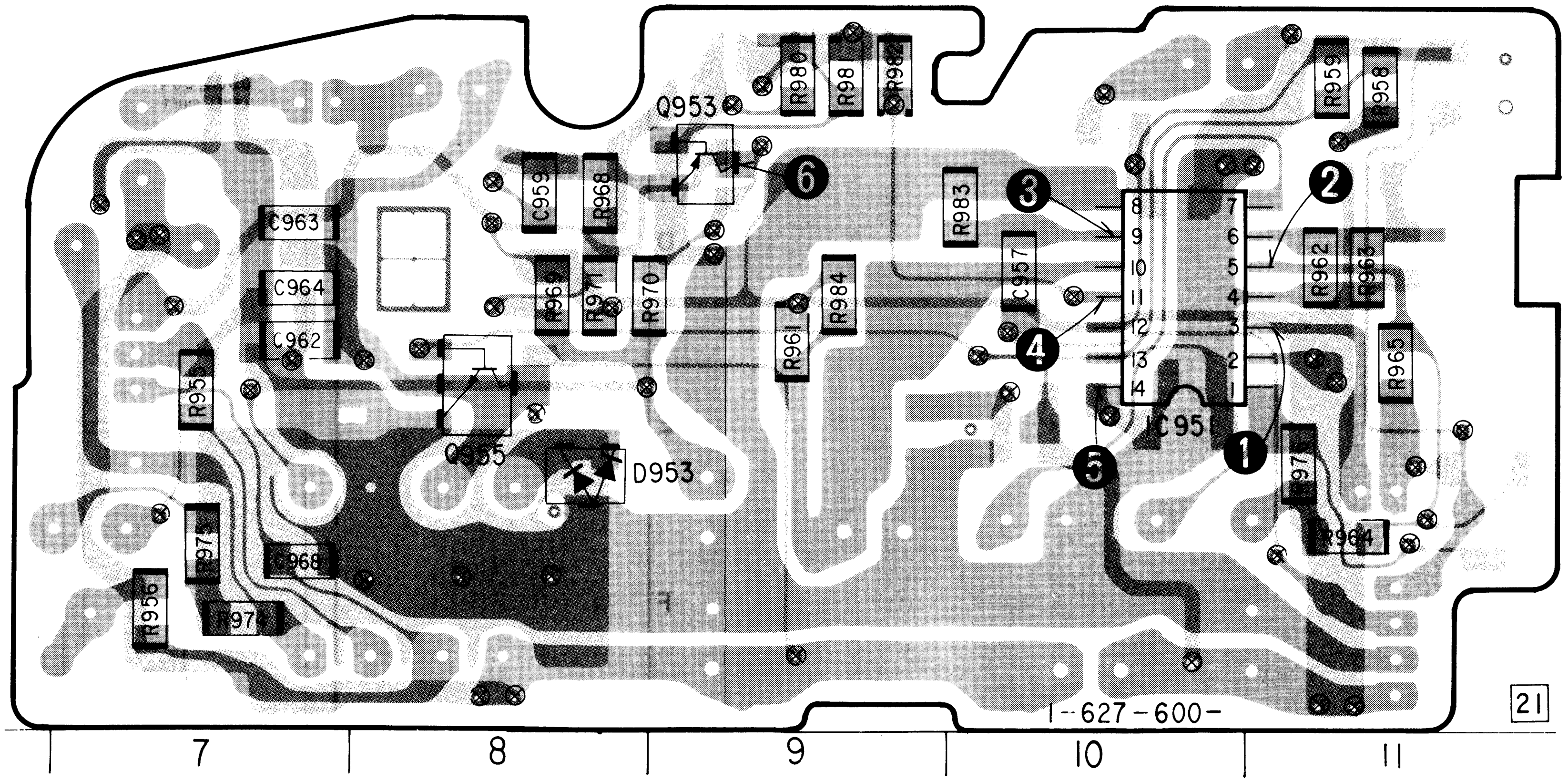

TO VF-12P BOARD
W951
CRT
M01JYZ60WB
H1
H2
G1
G2
HV
V901
A
B
C
D951
RV951
R957
C954
R960
C955
E
D
C
B
Q954
R979
R967
L952
R971
C965
CN953
A
L953
C961
R973
R972
C969
T951
W951
RV954
RV952
CN952
CN951
TH951
C951
L951
C958
C956
C966
C960
R953
C953
R978
1-627-600-
1
2
3
4
5
6

VF-12P BOARD (CONDUCTOR SIDE)

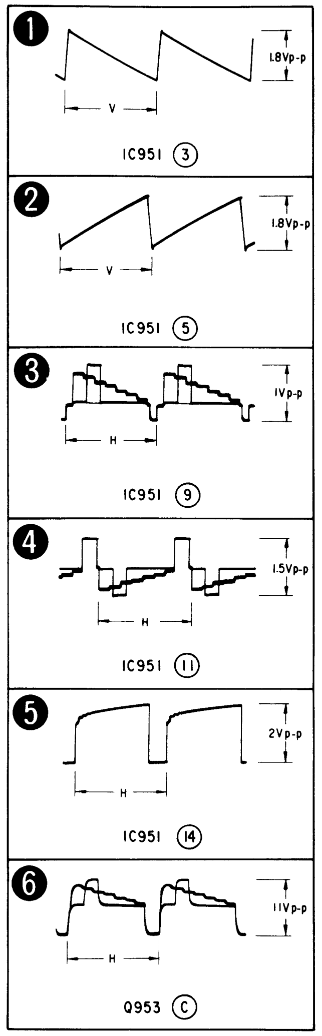

Q953
R980
R98
C959
R968
C963
C964
C962
R969
R971
R970
R961
R984
R959
Q955
D953
R975
R956
R974
C968
6
7
8
9


TO VF-12P
BOARD
W951
CRT
M01JYZ60WB
H1
H2
G1
G2
HV
V901
CN953
C965
L952
L953
R979
R967
R971
C961
R973
R972
C969
T951
C966
C960
W951
RV954
1-627-600-
21
4
5
6

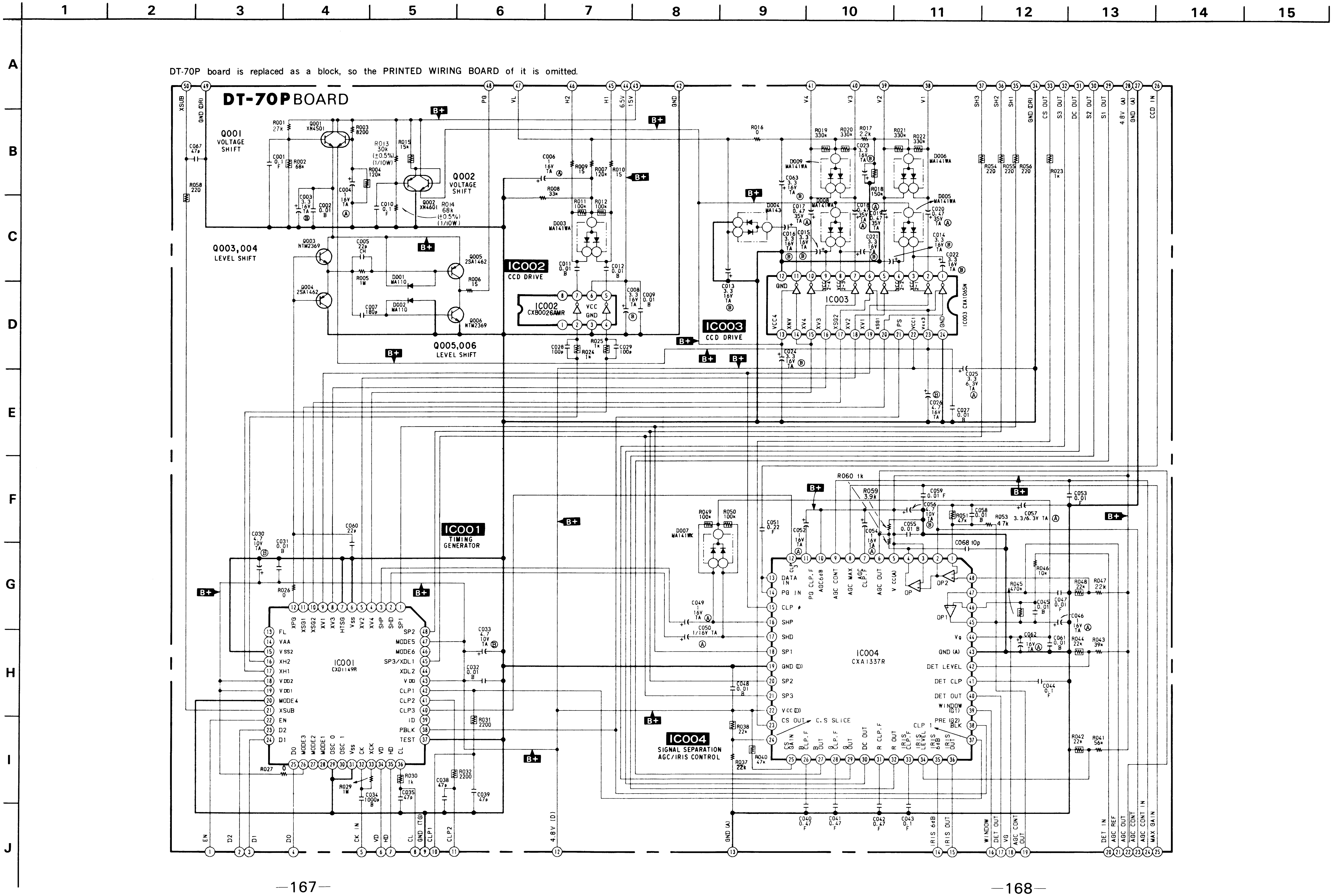
VF-12P BOARD(CONDUCTOR SIDE)


Q953
R980
R981
R982
R983
R959
R958
C959
R968
R969
R971
R970
R961
R984
C957
R962
R963
R965
C963
C964
C962
Q955
D953
R957
R975
R956
R974
C968
IC951
R964
R967
1-627-600-
21
7
8
9
10
11

VF-12P BOARD



DT-70P (TIMING GENERATOR, CCD DRIVER) SCHEMATIC DIAGRAM

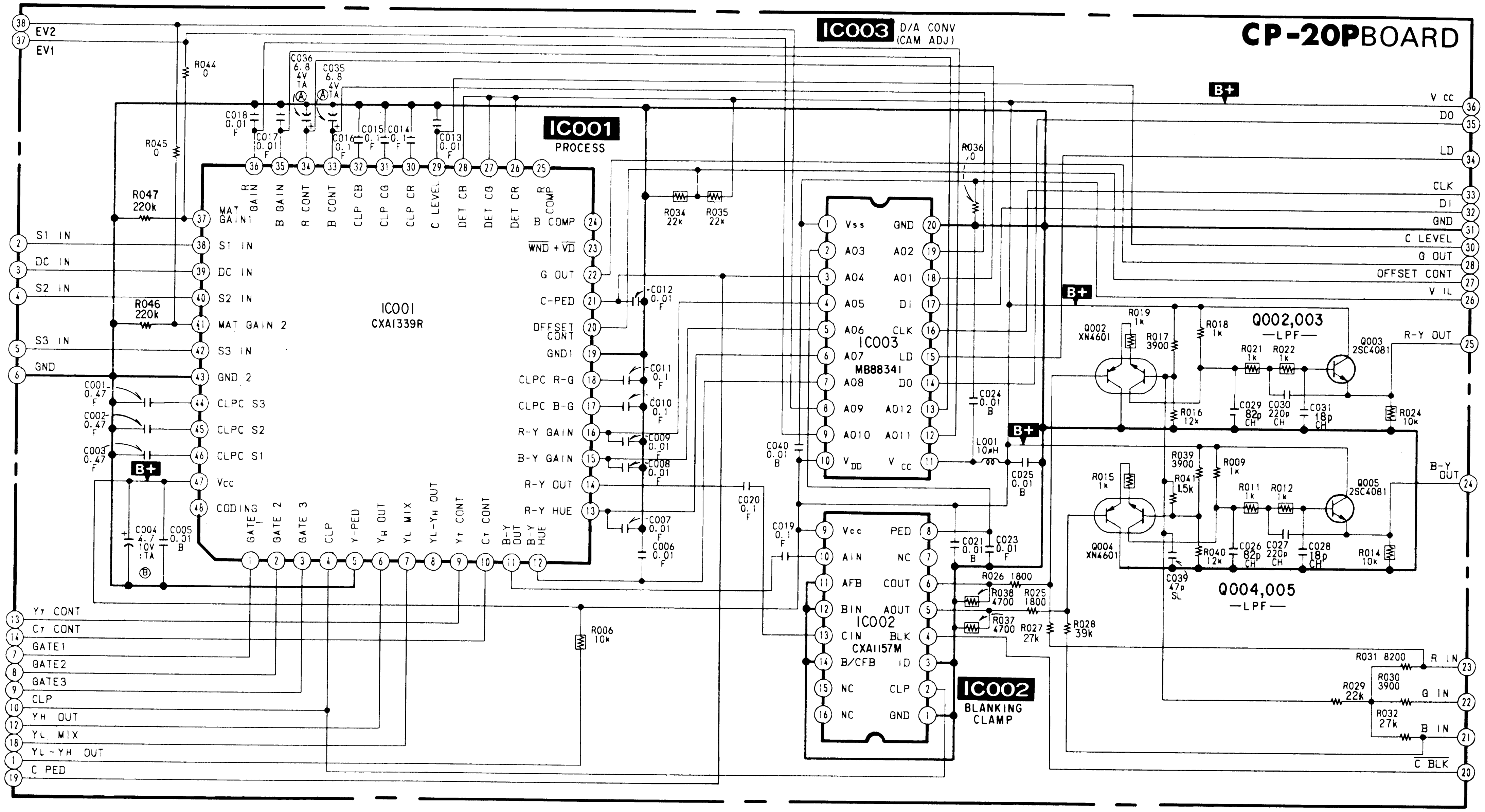


DT-70P board is replaced as a block, so the PRINTED WIRING BOARD of it is omitted.

DT-70P BOARD
Q001 VOLTAGE SHIFT
Q002 VOLTAGE SHIFT
Q003,004 LEVEL SHIFT
Q005,006 LEVEL SHIFT
IC001 TIMING GENERATOR
IC001 CXD1149R
IC002 CCD DRIVE
IC002 CXB0026AMR
IC003 CCD DRIVE
IC003 CXA1065N
IC004 SIGNAL SEPARATION AGC/IRIS CONTROL
IC004 CXA1337R
B+
XSUB
GND (DR)
PG
VL
H2
H1
6.5V
15V
GND
V4
V3
V2
V1
SH3
SH2
SH1
GND (DR)
CS OUT
S3 OUT
DC OUT
S2 OUT
S1 OUT
4.8V (A)
GND (A)
CCD IN
EN
D2
D1
D0
CK IN
VD
HD
CL
GND (TG)
CLP1
CLP2
4.8V (D)
GND (A)
IRIS 6dB
IRIS OUT
WINDOW
DET OUT
VG
AGC CONT OUT
DET IN
AGC REF
AGC CONT
AGC CONT IN
MAX GAIN
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J

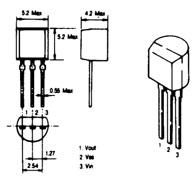
CP-20P (CAMERA PROCESS) SCHEMATIC DIAGRAM

CP-20P board is replaced as a block, so the PRINTED WIRING BOARD of it is omitted.

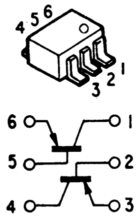

CP-20PBOARD
IC001 PROCESS
IC001 CXA1339R
IC002 BLANKING CLAMP
IC002 CXA1157M
IC003 D/A CONV (CAM ADJ)
IC003 MB88341
Q002,003 —LPF—
Q004,005 —LPF—
Q002 XN4601
Q003 2SC4081
Q004 XN4601
Q005 2SC4081
B+
EV2
EV1
S1 IN
DC IN
S2 IN
S3 IN
GND
Y7 CONT
C7 CONT
GATE1
GATE2
GATE3
CLP
YH OUT
YL MIX
YL-YH OUT
C PED
V cc
DO
LD
CLK
DI
GND
C LEVEL
G OUT
OFFSET CONT
V IL
R-Y OUT
B-Y OUT
R IN
G IN
B IN
C BLK
MAT GAIN1
S1 IN
DC IN
S2 IN
MAT GAIN 2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
Vcc
CODING
R GAIN
B GAIN
R CONT
B CONT
CLP CB
CLP CG
CLP CR
C LEVEL
DET CB
DET CG
DET CR
R COMP
B COMP
WND + VD
G OUT
C-PED
OFFSET CONT
GND1
CLPC R-G
CLPC B-G
R-Y GAIN
B-Y GAIN
R-Y OUT
R-Y HUE
GATE 1
GATE 2
GATE 3
CLP
Y-PED
YH OUT
YL MIX
YL-YH OUT
Y7 CONT
C7 CONT
B-Y OUT
B-Y HUE
Vss
A03
A04
A05
A06
A07
A08
A09
A010
VDD
GND
A02
A01
DI
CLK
LD
DO
A012
A011
Vcc
AIN
AFB
BIN
CIN
B/CFB
NC
PED
COUT
AOUT
BLK
ID
R044 0
R045 0
R047 220k
R046 220k
R034 22k
R035 22k
R036 0
R006 10k
R019 1k
R017 3900
R018 1k
R021 1k
R022 1k
R016 12k
R024 10k
R039 3900
R041 1.5k
R009 1k
R015 1k
R011 1k
R012 1k
R040 12k
R014 10k
R026 1800
R025 1800
R038 4700
R037 4700
R027 27k
R028 39k
R031 8200
R030 3900
R029 22k
R032 27k
C036 6.8 4V TA
C035 6.8 4V TA
C018 0.01 F
C017 0.01 F
C016 0.1 F
C015 0.1 F
C014 0.1 F
C013 0.01 F
C012 0.01 F
C011 0.1 F
C010 0.1 F
C009 0.01
C008 0.01
C007 0.01 F
C006 0.01 F
C001 0.47 F
C002 0.47 F
C003 0.47 F
C004 4.7 10V TA
C005 0.01 B
C020 0.1 F
C019 0.1 F
C040 0.01 B
C024 0.01 B
L001 10μH
C025 0.01 B
C021 0.01 B
C023 0.01 F
C029 82p CH
C030 220p CH
C031 18p CH
C026 82p CH
C027 220p CH
C028 18p CH
C039 47p SL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J

4-3. SEMICONDUCTORS

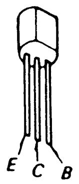
S-81350AG


5.2 Max
4.2 Max
5.2 Max
0.56 Max
1 2 3
1.27
2.54
1. Vout
2. Vss
3. Vin
1 2 3

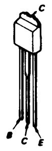
1MT1US


4 5 6
3 2 1
6
5
4
1
2
3

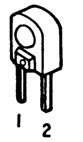
2SA733



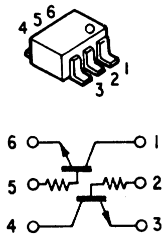
2SA1242



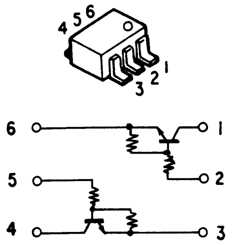
PT4850F



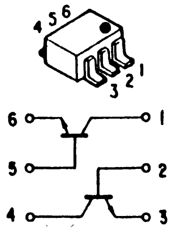
XN4210


4 5 6
3 2 1
6
5
4
1
2
3

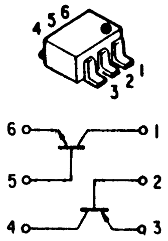
XN4213


4 5 6
3 2 1
6
5
4
1
2
3

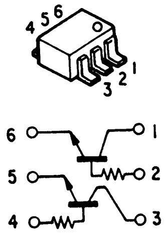
XN4501


4 5 6
3 2 1
6
5
4
1
2
3

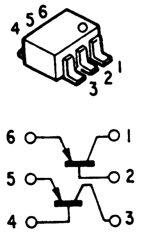
XN4601


4 5 6
3 2 1
6
5
4
1
2
3

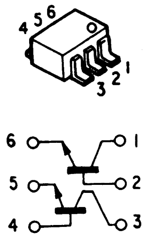
XN6215


4 5 6
3 2 1
6
5
4
1
2
3

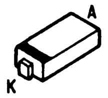
XN6401


4 5 6
3 2 1
6
5
4
1
2
3

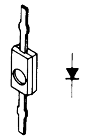
XN6501


4 5 6
3 2 1
6
5
4
1
2
3

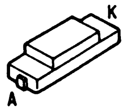
1T33C
MA110
MA111
MA121
MA8082



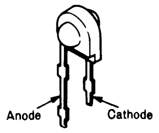
1T32



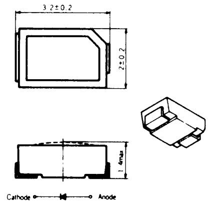
CL-50R-CD
CL-50Y-CD



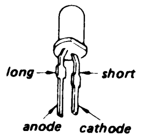
GL453


Anode
Cathode

LN1251C


3.2±0.2
2±0.2
1.4max
Cathode
Anode

TLR124


long
short
anode
cathode

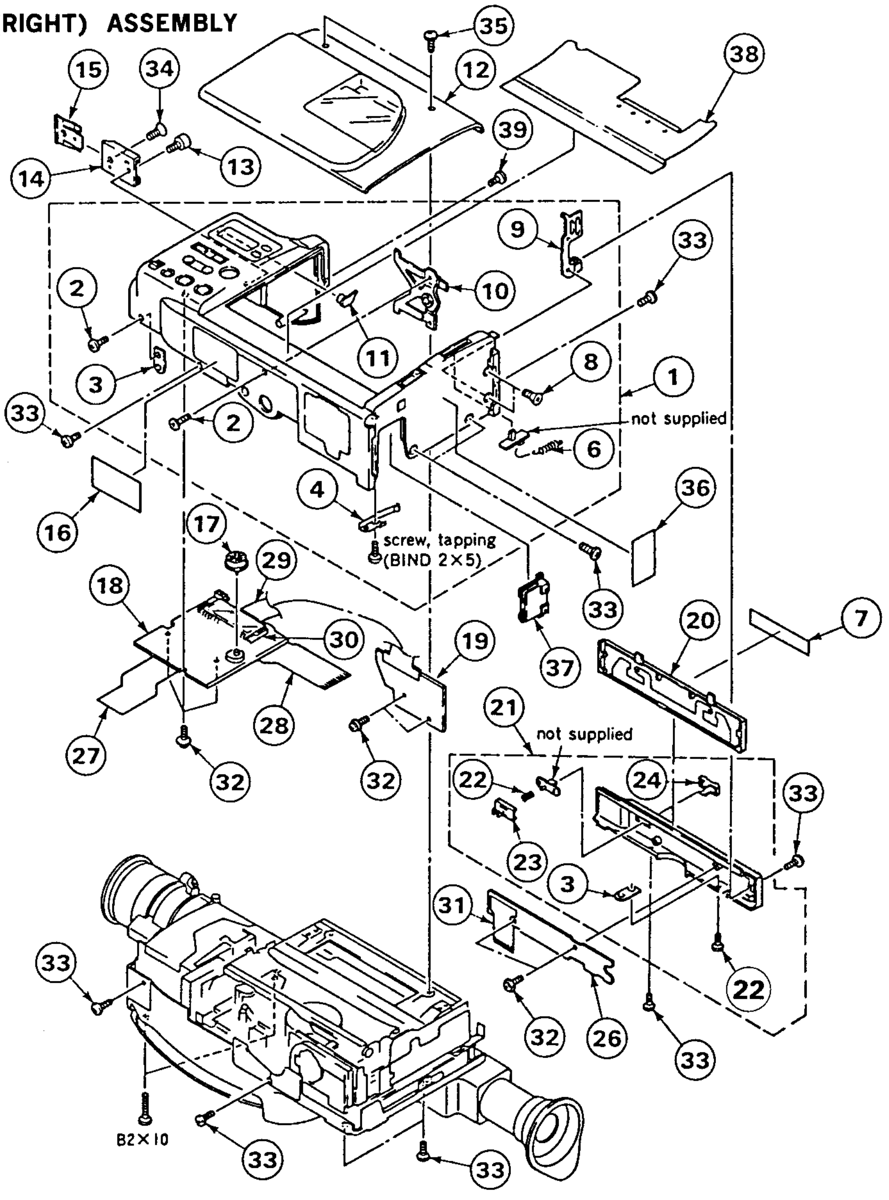
SECTION 5
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) ... KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts' Color

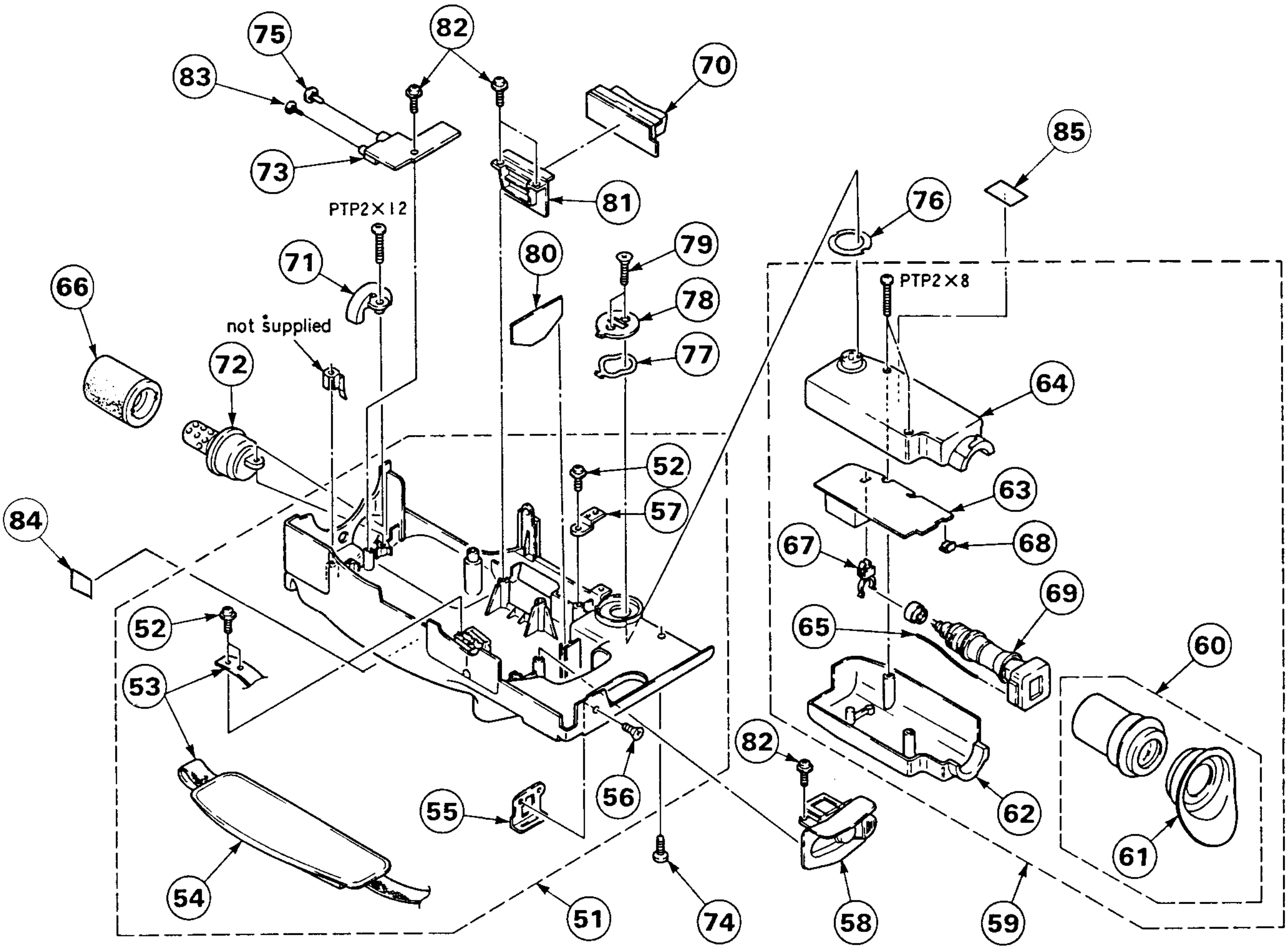
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (RIGHT) ASSEMBLY



Ref.No	Part No.	Description	Remarks
1	X-3727-918-1	CABINET (RIGHT) ASSY	2-6, 8-11
2	3-713-786-01	SCREW (M2X4)	
3	3-727-915-01	NUT, PLATE	
4	3-727-921-01	SPRING, LEAF	
6	3-674-402-00	SPRING, TENTION	
7	★3-713-908-01	LABEL, CAUTION LS LID	
8	3-713-787-11	SCREW (M2X3)	
9	3-728-161-01	BRACKET (A), STRAP	
10	3-728-168-01	SCREW, TRIPOD	
11	3-727-922-01	PLATE, LIGHT GUIDE REC	
12	X-3713-985-1	LID ASSY, CASSETTE COMPARTMENT	
13	3-678-103-11	SCREW, EVF STOPPER	
14	3-688-985-01	SHOE, ACCESSORY	
15	3-688-940-01	SPRING, LEAF	
16	★3-725-344-01	LABEL, MODEL NUMBER (AEP MODEL)	
	★3-725-385-01	LABEL, MODEL NUMBER (UK, E, AUS MODEL)	
17	3-728-180-01	KNOB, IRIS	
18	★A-7061-401-A	FC-13P BOARD, COMPLETE	
19	★A-7061-400-A	DH-4P BOARD, COMPLETE	
20	X-3727-901-1	LID ASSY, LS	
21	X-3713-986-1	CABINET (UPPER) ASSY	2, 3, 22-24
22	3-303-973-01	SPRING COMPRESSION	
23	3-727-917-01	PLATE, LOCK, P	
24	3-724-586-01	KEY TOP, POWER	
26	★1-627-605-21	FK-7P BOARD	
27	1-627-617-11	FP-103 BOARD, FLEXIBLE	
28	1-627-616-11	FP-102 BOARD, FLEXIBLE	
29	1-627-615-11	FP-101 BOARD, FLEXIBLE	
30	3-728-224-01	HOLDER, LCD	
31	1-627-619-11	FP-110 BOARD, FLEXIBLE	
32	4-356-741-11	SCREW, TAPPING (BIND 2X6)	
33	3-719-381-01	SCREW (M2X4)	
34	3-719-831-01	SCREW (M2X6)	
35	3-727-902-01	SCREW (M1.4), SPECIAL	
36	★3-719-683-01	LABEL, BATTERY FITTING	
37	1-535-658-11	TERMINAL BOARD	
38	3-728-271-01	COVER DRUM	
39	3-713-786-11	SCREW (M2X6)	

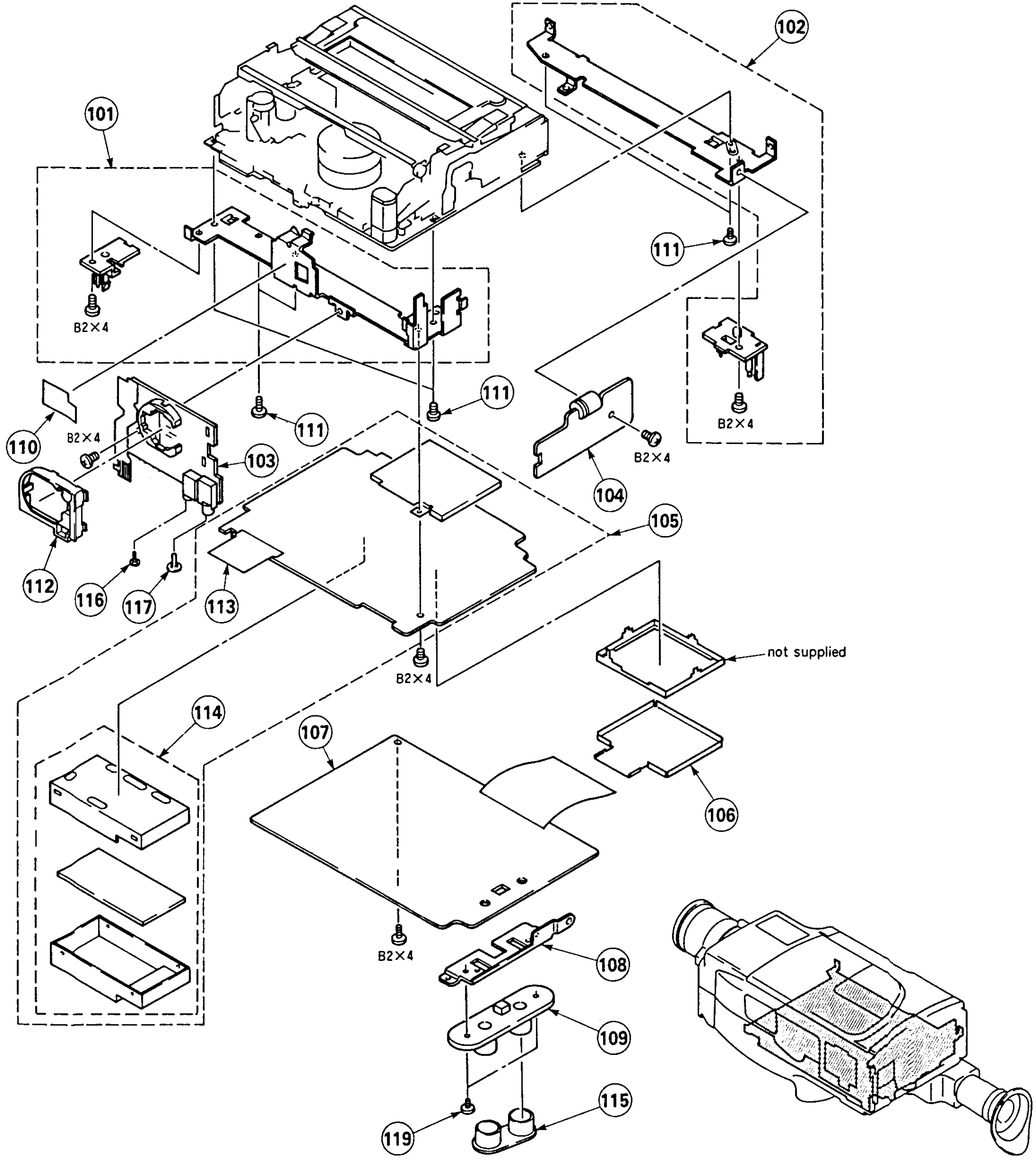
5-2. CABINET (LEFT), EVF COMPLETE ASSEMBLY



Ref.No	Part No.	Description	Remarks
51	X-3713-987-1	CABINET (L) ASSY	52-57
52	3-669-480-21	+ PTPWH 2	
53	3-724-582-41	BELT, GRIP	
54	3-724-591-01	PAD, GRIP	
55	3-727-914-01	BRACKET (B), STRAP	
56	3-713-787-11	SCREW (M2X3)	
57	3-727-901-01	JOINT, CABINET (UPPER)	
58	X-3727-912-1	COVER ASSY GRIP	
59	A-7019-126-A	EVF, COMPLETE ASSY	60-65, 67-69
60	A-7080-549-A	FINDER BLOCK ASSY	61
61	3-733-922-01	EYE CUP	
62	3-728-236-01	CABINET (LEFT) VF	
63	* A-7061-403-A	VF-12P BOARD, COMPLETE	
64	X-3727-907-1	CABINET (R) ASSY, VF	
65	1-574-088-11	FIBER, OPTICAL	
66	X-2536-712-1	SCREEN, WINDOW ASSY	
67	3-727-911-01	HOLDER, CRT NECK	
68	3-727-912-01	HOLDER, LED	
69	⚠1-452-482-21	CRT ASSY (M01JYZ60WB)	
70	1-571-667-11	SWITCH, PUSH	
71	3-728-184-01	HOLDER, MICROPHONE	
72	1-542-101-11	MICROPHONE (C-2020)	
73	* A-7061-405-A	MC-23P BOARD, COMPLETE	
74	3-719-381-01	SCREW (M2X4)	
75	3-728-267-01	COVER 3.5 JACK	
76	3-727-918-01	SPACER (A), TILT	
77	3-727-925-01	SPRING, LEAF	
78	3-727-919-01	SUPPORT, TILT	
79	3-719-831-01	SCREW (M2X6)	
80	* 1-627-607-21	CR-16P BOARD	
81	3-728-157-01	HOLDER, ZOOM	
82	4-356-741-21	SCREW, TAPPING (BIND 2X8)	
83	3-728-266-01	COVER, 2.5 JACK	
84	2-359-729-02	LABEL, BEAB (UK MODEL)	
85	3-704-235-01	LABEL, CAUTION (UK MODEL)	

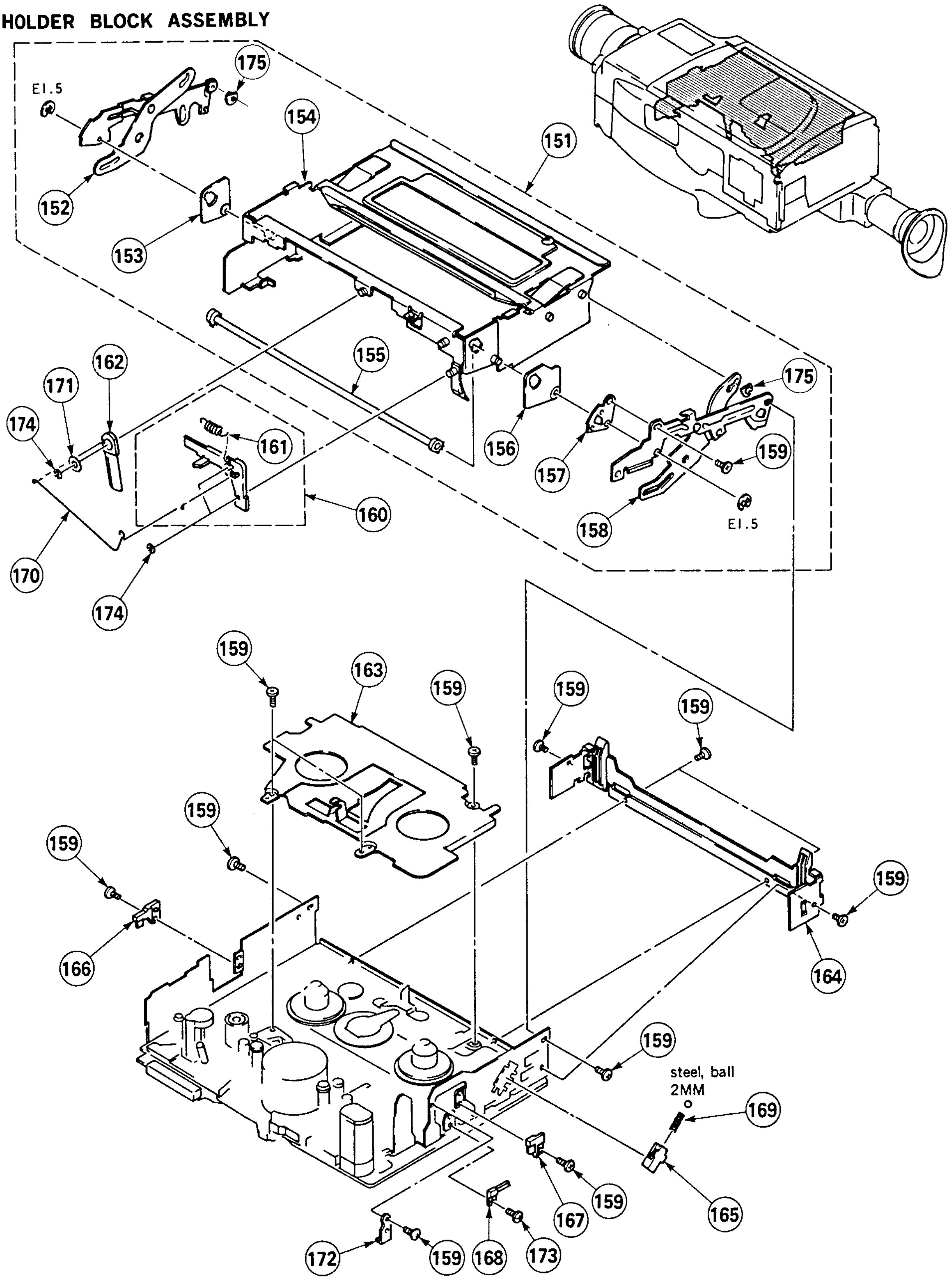
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-3. MAIN BOARD, FRAME (T.B) ASSEMBLY


101
102
111
B2×4
111
111
B2×4
110
B2×4
103
104
B2×4
105
112
116
117
113
B2×4
not supplied
114
107
106
B2×4
108
109
115
119

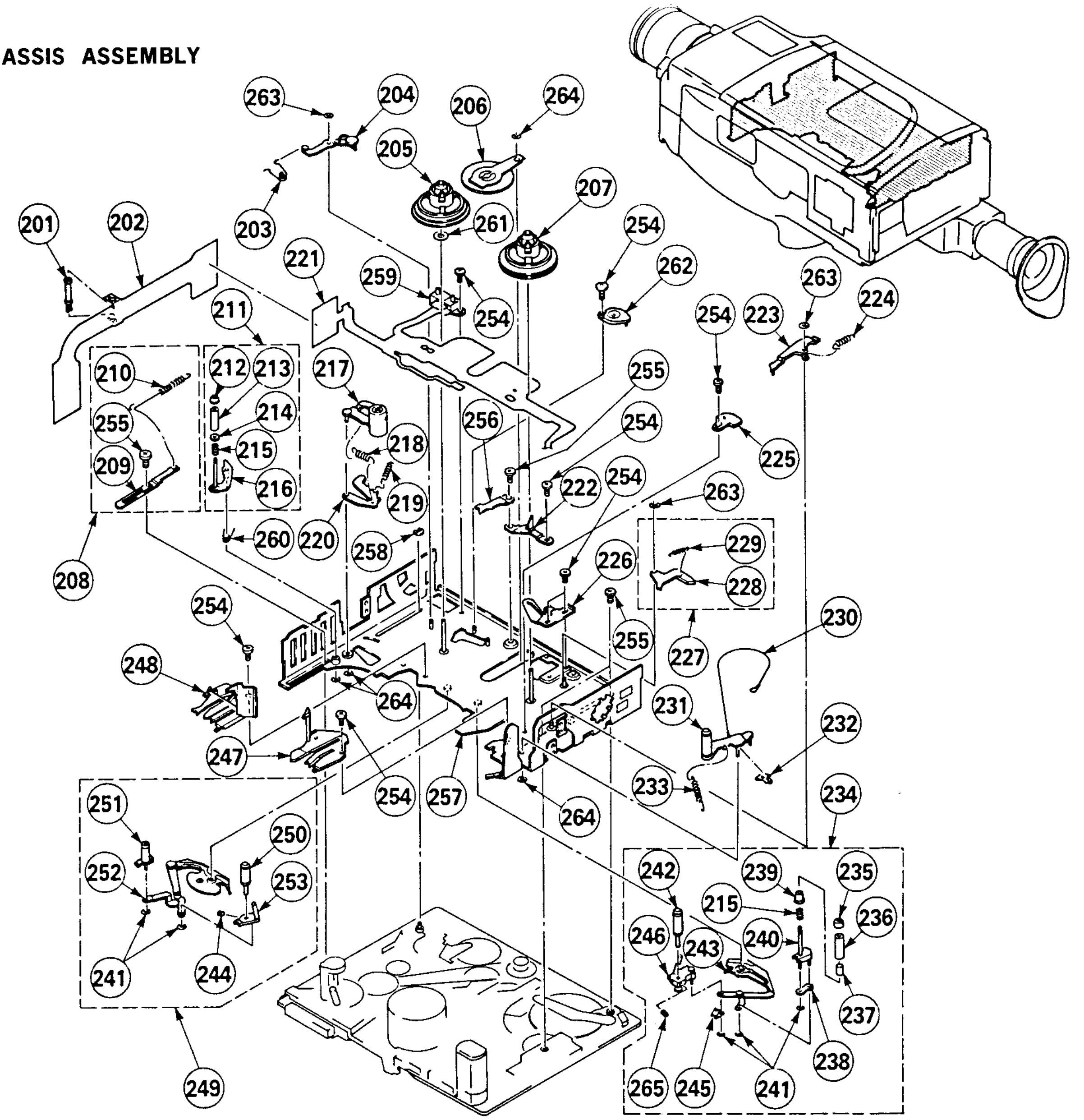
Ref.No	Part No.	Description	Remarks
101	X-3727-910-1	FRAME (B) ASSY	
102	X-3727-909-1	FRAME (T) ASSY	
103	*A-7061-397-A	LB-12P BOARD, COMPLETE	
104	*A-7061-390-A	FU-61P BOARD, COMPLETE	
105	*A-7061-388-A	SS-82P BOARD, COMPLETE	113, 114
106	*X-3727-956-1	CASE (UPPER) ASSY, SHIELD RP	
107	*A-7061-387-A	VA-39 BOARD, COMPLETE	
108	X-3727-902-1	PLATE ASSY, JACK	
109	1-537-142-11	TERMINAL BOARD (J001)	
110	3-727-905-01	COVER, TRIPOD	
111	3-703-816-01	SCREW (M1.4X2.0), SPECIAL HEAD	
112	*3-728-169-11	PLATE, ORNAMENTAL	
113	*1-627-618-11	FP-104 BOARD, FLEXIBLE	
114	A-7068-132-A	DD-7 BOARD, COMPLETE	
115	3-728-268-01	COVER, JACK PLATE	
116	3-728-266-01	COVER, 2.5 JACK	
117	3-728-267-01	COVER, 3.5 JACK	
119	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	

5-4. HOLDER BLOCK ASSEMBLY


175
E1.5
154
151
152
153
155
162
171
174
161
156
157
159
175
158
E1.5
160
170
174
159
163
159
159
159
159
159
166
164
159
steel, ball
2MM
169
167
159
165
172
159
168
173

Ref.No	Part No.	Description	Remarks
151	* A-7040-156-A	HOLDER BLOCK ASSY	152-159, 175
152	X-3727-937-2	ARM (T) ASSY, F	
153	3-728-145-01	BEARING (T), MIDWAY GEAR	
154	X-3727-950-2	HOLDER ASSY	
155	X-3727-920-1	GEAR ASSY, MIDWAY	
156	3-728-146-01	BEARING (S), MIDWAY GEAR	
157	3-727-992-01	PLATE, ADJUSTMENT, C ARM	
158	X-3727-938-2	ARM (S) ASSY, F	
159	3-728-103-01	SCREW (M1.4X1.6), SPECIAL HEAD	
160	A-7040-164-A	ARM BLOCK ASSY, TP	
161	3-667-309-00	SPRING, TENSION	
162	X-3727-922-2	PROTECTOR, ASSY, T	
163	3-728-227-03	BASE, LED	
164	X-3727-921-2	FRAME ASSY, LS	
165	3-727-973-01	HOLDER, BS	
166	3-727-954-01	HOLDER, (T) SENSOR	
167	3-727-957-01	HOLDER, (S) SENSOR	
168	1-544-938-11	SWITCH, LEAF (S911)	
169	3-727-935-01	SPRING, COMPRESSION	
170	3-728-277-01	BAR, JOINT	
171	3-728-278-01	WASHER	
172	3-727-946-01	SUPPORT, LS	
173	3-728-148-01	SCREW (M1.4X2.5), SPESIAL HEAD	
174	3-331-007-11	WASHER	
175	3-727-993-01	SHAFT ARM, A	

5-5. LS CHASSIS ASSEMBLY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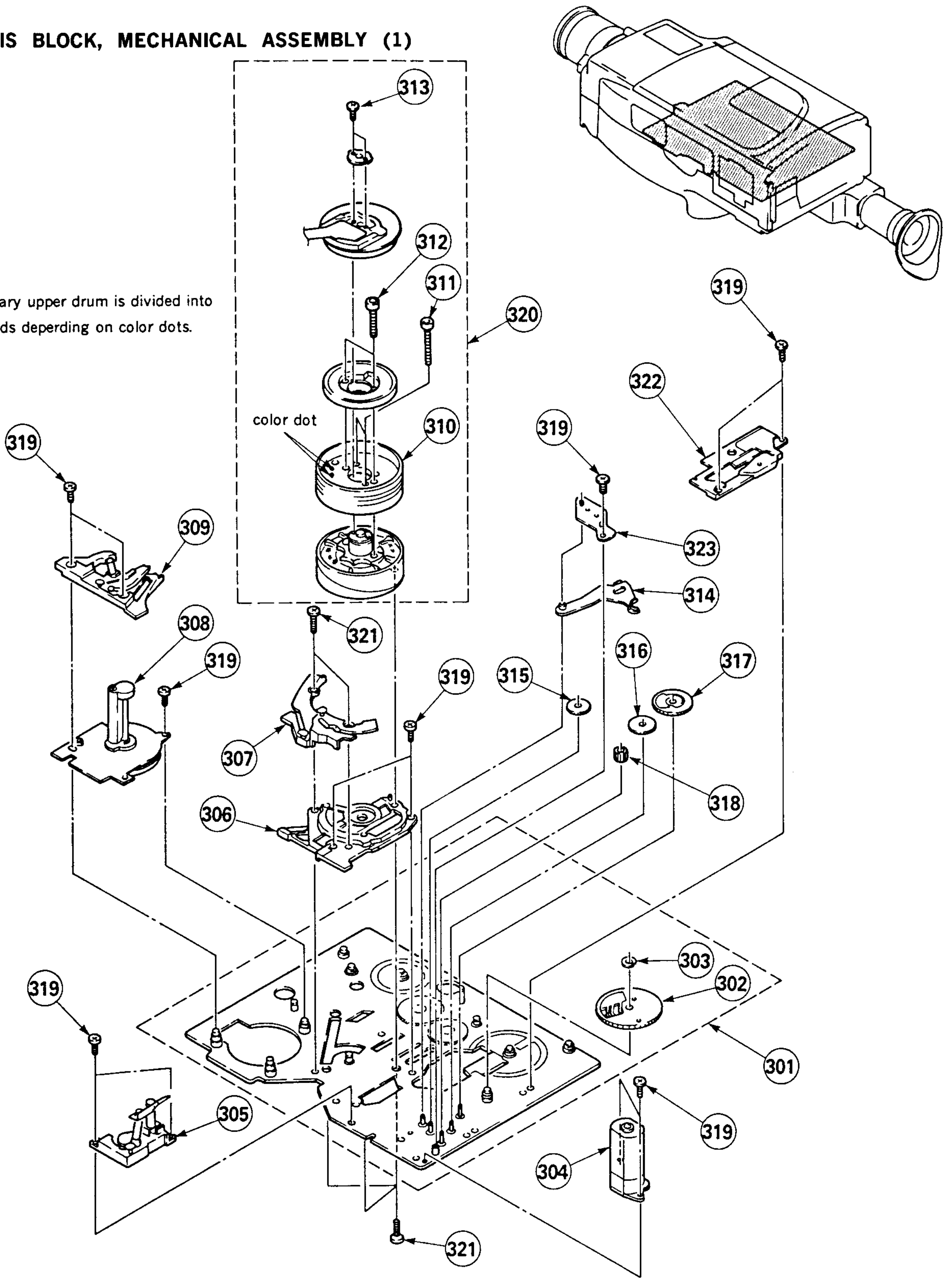
Ref.No	Part No.	Description	Remarks
201	3-728-077-01	SHAFT ROTARY, FLEXIBLE	
202	1-627-722-11	FP-149 BOARD, FLEXIBLE	
203	3-728-066-01	SPRING	
204	X-3727-927-1	RATCHET, ASSY T	
205	X-3727-951-2	TABLE ASSY, REEL TAKE-UP	
206	X-3727-926-1	ARM ASSY, GEAR	
207	X-3727-952-5	TABLE ASSY, REEL, SUPPLY	
208	A-7040-150-A	SLIDER BLOCK ASSY, CAM	209, 210, 255
209	3-728-089-01	SLIDER CAM	
210	3-727-936-01	SPRING TENSION	
211	A-7040-151-A	ARM BLOCK ASSY, TG11	212-216
212	3-728-131-01	FLANGE, UPPER, TG11	
213	3-728-133-01	SLEEVE, TG11	
214	3-728-069-01	FLANGE, LOWER, TG11	
215	3-728-023-01	SPRING, COMPRESSION	
216	X-3727-913-1	ARM ASSY, TG11	
217	A-7040-146-D	ARM ASSY, PINCH	
218	3-727-927-01	SPRING, (POWER TENSION), TENSION	
219	3-727-928-01	SPRING, TENSION	
220	X-3727-929-2	ARM ASSY LIMITER	
221	*A-7061-238-A	FP-115 BOARD, COMPLETE	166-168, 259
222	X-3727-928-1	BASE ASSY RL	
223	3-728-201-01	RATCHET S	
224	3-728-121-01	SPRING, TENSION	
225	3-728-200-03	ADJUSTMENT BLOCK, TG1	
226	3-728-206-01	PLATE, CAM, LS	
227	A-7040-158-C	ARM BLOCK ASSY, S SOFT	228, 229
228	3-728-205-01	ARM, S SOFT	
229	3-728-072-01	SPRING, TENSION	
230	X-3727-923-2	STRING, ASSY	
231	X-3727-946-3	ARM ASSY, TG1	
232	3-728-124-01	HOLDER JOINT	
233	3-728-071-01	SPRING, TENSION	
234	A-7040-149-A	ARM (S) BLOCK ASSY, GUIDE	215, 235-243, 245, 246, 265
235	3-728-037-01	FLANGE, UPPER, TG4	
236	3-728-049-01	ROLLER, TG4	
237	3-728-048-01	SLEEVE, TG4	
238	3-728-053-01	PLATE, UNDER, TG4	
239	3-728-047-01	FLANGE, LOWER, TG4	
240	X-3727-936-2	BASE ASSY TG4	
241	3-331-007-11	WASHER	
242	X-3727-935-5	ROLLER ASSY TG5	
243	X-3727-941-1	ARM (S) ASSY GUIDE	
244	3-728-290-01	SCREW (M1.2)	
245	3-728-062-01	SPRING (6GB), LEAF	
246	X-3727-948-1	BASE ASSY, TG6	
247	3-728-226-01	RAIL (S), GUIDE	
248	3-728-244-01	RAIL (T), GUIDE	
249	A-7040-148-A	ARM (T) BLOCK ASSY, GUIDE	241, 244, 250-253
250	X-3727-932-2	ROLLER ASSY, TG8	
251	X-3727-919-2	BASE UNIT ASSY, TG9	
252	X-3727-940-1	ARM (T) ASSY, GUIDE	
253	X-3727-947-1	BASE ASSY, TG7	
254	3-728-103-01	SCREW (M1.4X1.6) SPECIAL HEAD	
255	3-728-126-01	SCREW (M1.4X2) SPECIAL HEAD	
256	3-728-288-01	RETAINER	
257	X-3727-953-2	CHASSIS ASSY LS	
258	3-578-254-00	RING, RETAINING, E1.2	
259	1-571-647-11	SWITCH, PUSH (S992)	
260	3-727-939-01	SPRING, TORSION	
261	3-701-439-11	WASHER	
262	X-3727-914-1	CLUTCH ASSY, ONEWAY	
263	3-728-091-01	WASHER, STOPPER	
264	3-315-414-31	WASHER	
265	3-728-289-01	SCREW (M1.2)	

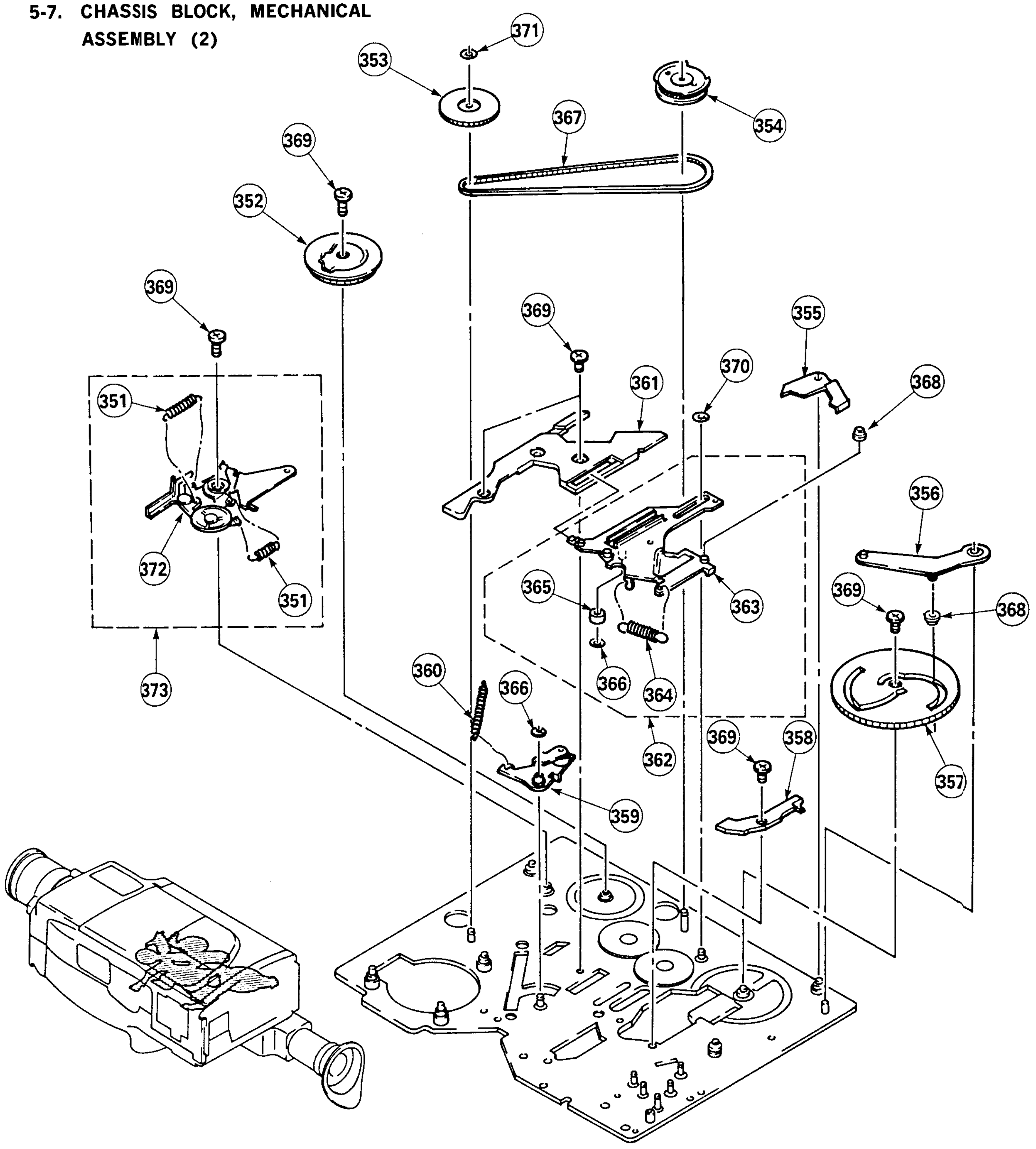
5-6. CHASSIS BLOCK, MECHANICAL ASSEMBLY (1)

Note : The rotary upper drum is divided into two kinds deperding on color dots.



Ref.No	Part No.	Description	Remarks
301	A-7040-154-A	CHASSIS BLOCK ASSY, MECHANICAL	302, 303
302	X-3727-915-1	GEAR ASSY, MODE	
303	3-325-290-21	WASHER, STOPPER	
304	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING) M903	
305	A-7040-174-A	BASE (1) BLOCK ASSY, (2), RAIL	
306	X-3727-949-1	BASE ASSY, DRUM	
307	A-7040-171-C	BASE (2),BLOCK ASSY, GUIDE RAIL	
308	8-835-329-01	MOTOR, DC U-21A (CAPSTAN) M902	
309	X-3727-933-3	BASE (3) ASSY, GUIDE RAIL	
310	A-7049-197-A	DRUM ASSY, ROTARY (UPPER) (DGR-37-R-(1)) COLOR DOT:GREEN, BLACK, GREEN-BROWN, BLACK-BROWN	
310	A-7049-198-A	DRUM ASSY, ROTARY (UPPER) (DGR-37-R-(2)) COLOR DOT:RED, BLUE, RED-BROWN, BLUE-BROWN	
311	3-727-809-01	BOLT (M1.4X5), HEXAGON SOCKET	
312	3-727-807-01	BOLT (M1.7X3.3), HEXAGON SOCKET	
313	3-728-108-21	SCREW (M1.4X2.7)	
314	X-3727-906-1	ARM ASSY	
315	X-3727-903-1	GEAR ASSY, NO.1	
316	X-3727-904-1	GEAR ASSY, NO.2	
317	X-3727-905-1	GEAR ASSY, NO.3	
318	3-728-149-01	GEAR, NO.0	
319	3-728-148-01	SCREW (M1.4X2.5), SPEXIAL HEAD	
320	A-7048-214-A	DRUM ASSY (DGH-37A-R) M901	310-313
321	3-728-108-01	SCREW (M1.4X4.5)	
322	3-728-231-01	BASE, TG-1 CAM	
323	3-728-119-01	RETAINER, GEAR	

5-7. CHASSIS BLOCK, MECHANICAL ASSEMBLY (2)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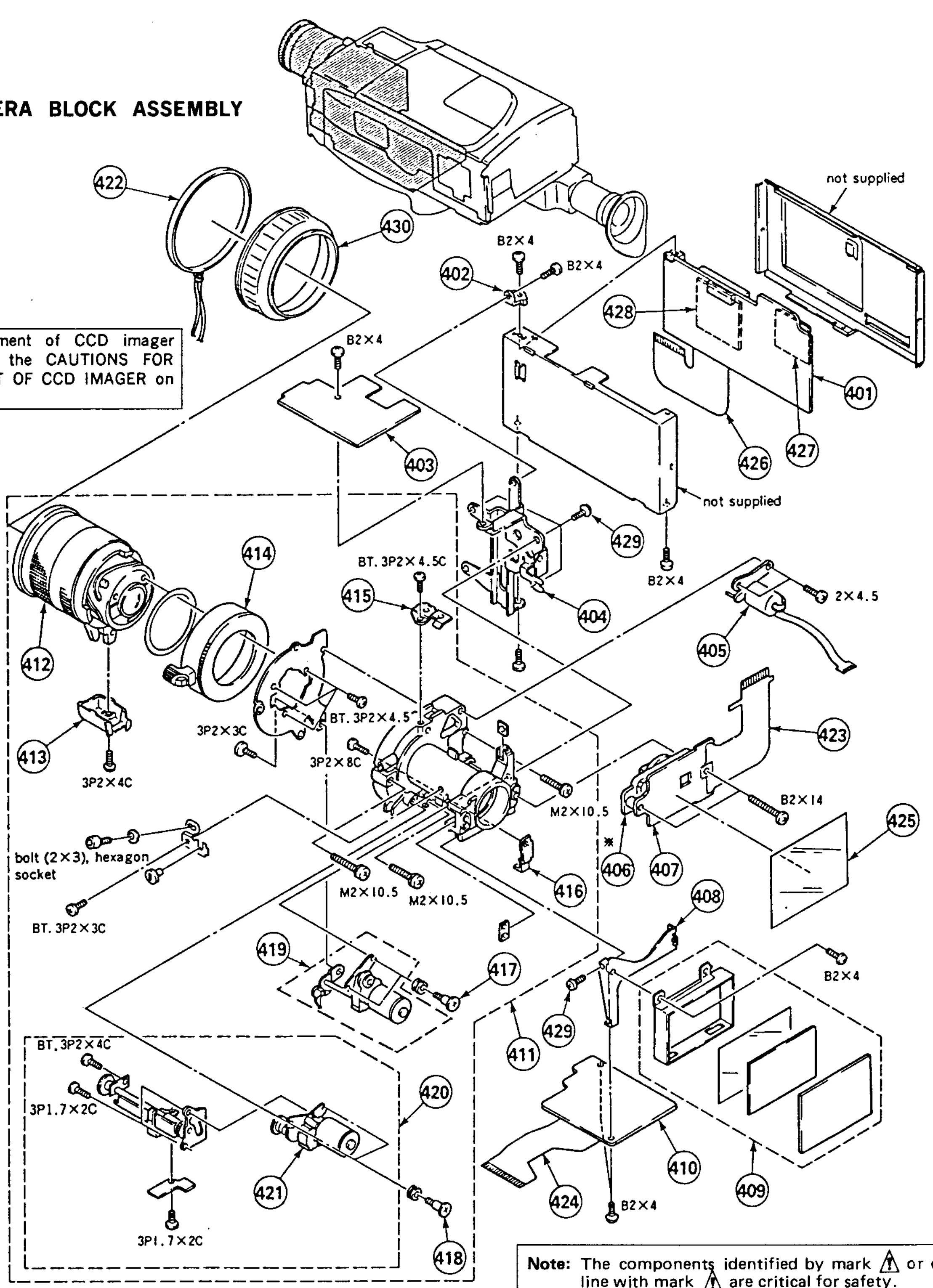
Ref.No	Part No.	Description	Remark
351	3-728-065-01	SPRING, TENSION	
352	3-728-190-01	CAM (B)	
353	X-3727-930-1	GEAR ASSY, CONVERSION	
354	X-3727-931-1	PULLEY ASSY, MIDWAY	
355	3-728-154-01	ARM, EJ	
356	X-3727-916-1	ARM ASSY, LS	
357	3-728-208-01	CAM (A)	
358	3-728-213-01	SUPPORT (S), GL	
359	X-3727-924-2	ARM ASSY, GUIDE LOCK	
360	3-728-015-01	SPRING (POWER TENSION),TENSION	
361	3-728-228-01	SUPPORT (T), GL	
362	A-7040-153-A	SLIDER BLOCK ASSY, GL	363-366

Ref.No	Part No.	Description	Remark
363	X-3727-942-1	SLIDER ASSY, GL	
364	3-727-929-01	SPRING (POWER TENSION),TENSION	
365	3-728-144-01	ROLLER, GL	
366	3-331-007-11	WASHER	
367	3-728-212-01	BELT, RELAY	
368	3-728-109-01	ROLLER, LS	
369	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
370	3-315-384-31	WASHER, STOPPER	
371	3-728-091-01	WASHER, STOPPER	
372	X-3727-944-1	ARM ASSY, PINCH PRESS	
373	A-7040-152-A	ARM BLOCK ASSY, PINCH PRESS	51, 372

5-8. CAMERA BLOCK ASSEMBLY

※ For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 101.



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B2×4
B2×4
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401
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426
not supplied
B2×4
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413
3P2×4C
BT.3P2×4.5C
415
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B2×4
2×4.5
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423
3P2×3C
BT.3P2×4.5
3P2×8C
M2×10.5
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bolt (2×3), hexagon socket
BT.3P2×3C
M2×10.5
M2×10.5
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B2×4
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BT.3P2×4C
3P1.7×2C
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3P1.7×2C
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B2×4
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Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remarks
401	* A-7061-391-A	VC-32P BOARD, COMPLETE	427, 428
402	3-727-910-01	BRACKET (B), CAMERA	
403	* A-7061-395-A	DM-21P BOARD, COMPLETE	
404	3-728-219-01	BRACKET (A) CAMERA	
405	3-707-497-01	METER ASSY, EE (IRIS) M904	
406	※ 8-750-010-89	IU024AK-10A	
407	* A-7061-396-A	CD-8P BOARD, COMPLETE	
408	3-728-158-01	BRACKET, AF	
409	⚠1-466-005-11	CONVERTER UNIT, DC-DC	
410	* A-7061-394-A	AF-36P BOARD, COMPLETE	
411	1-547-297-11	LENS, ZOOM (VCL-1206YJ)	412-421
412	3-707-368-01	RUBBER, FOCUS	
413	3-719-687-31	COVER, GEAR	
414	3-707-371-01	RING, ASSY ZOOM	
415	3-707-502-01	BRACKET, CABINET (A)	
416	3-707-503-01	BRACKET, CABINET (B)	
417	3-707-501-01	SCREW, (Z) MOTOR FITTING	
418	3-707-499-01	SCREW, (F) MOTOR FITTING	
419	3-707-500-01	MOTOR, ASSY Z	
420	3-707-498-01	MOTOR, ASSY AF GEAR	421
421	1-541-603-11	MOTOR DC (GM-1675)	
422	A-7090-806-A	CAP, ASSY HOOD	
423	1-627-612-12	FP-92 BOARD, FLEXIBLE	
424	1-627-620-11	FP-125 BOARD, FLEXIBLE	
425	*3-728-283-02	INSULATOR, CD	
426	1-627-613-11	FP-95 BOARD, FLEXIBLE	
427	A-7068-139-A	CP-20P BOARD HIC, COMPLETE	
428	A-7068-140-A	DT-70P BOARD HIC, COMPLETE	
429	3-727-903-01	SCREW (2X5), TAPPING + B	
430	3-728-269-01	HOOD	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
	*A-7061-388-A	SS-82P BOARD, COMPLETE			
		******************			
		(Ref. No. 3000 Series)			
		ST-27 BOARD			
		CAPACITOR			
C544	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C545	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C546	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
		SS-82P BOARD			
	1-627-618-11	FP-104 FLEXIBLE BOARD			
		CAPACITOR			
C311	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C312	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C313	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C314	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C316	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C318	1-135-150-21	TANTAL. CHIP	3.3MF	10%	6.3V
C319	1-135-150-21	TANTAL. CHIP	3.3MF	10%	6.3V
C320	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C321	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C322	1-135-161-21	TANTAL. CHIP	22MF	20%	6.3V
C323	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C324	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C325	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C326	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C327	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C328	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C329	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C331	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C334	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C335	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C336	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C337	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C338	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C339	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C340	1-135-161-21	TANTAL. CHIP	22MF	20%	6.3V
C341	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C342	1-135-161-21	TANTAL. CHIP	22MF	20%	6.3V
C343	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C345	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C346	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C347	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C348	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C350	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C352	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C355	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C357	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C361	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C362	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C363	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C364	1-135-150-21	TANTAL. CHIP	3.3MF	10%	6.3V
C365	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C366	1-135-150-21	TANTAL. CHIP	3.3MF	10%	6.3V
C367	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C368	1-135-161-21	TANTAL. CHIP	22MF	20%	6.3V
C369	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C370	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C371	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C372	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C373	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C374	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C375	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C376	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C377	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C378	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C379	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C401	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C402	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C403	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C404	1-135-149-21	TANTAL. CHIP	2.2MF	20%	6.3V
C405	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C406	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C407	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C408	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C409	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C410	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C411	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C412	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C414	1-124-779-00	ELECT	10MF	20%	16V
C417	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C418	1-162-638-11	CERAMIC CHIP	1MF		16V
C419	1-124-779-00	ELECT	10MF	20%	16V
C420	1-124-779-00	ELECT	10MF	20%	16V
C421	1-124-779-00	ELECT	10MF	20%	16V
C422	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C423	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C424	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C425	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C433	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C434	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C435	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C436	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C441	1-162-638-11	CERAMIC CHIP	1MF		16V
C442	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C444	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C451	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C452	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C453	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C454	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V

Ref.No	Part No.	Description			Remark
C455	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C456	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C457	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C458	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C459	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C460	1-162-638-11	CERAMIC CHIP	1MF		16V
C461	1-124-779-00	ELECT	10MF	20%	16V
C462	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C463	1-124-779-00	ELECT	10MF	20%	16V
C464	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C465	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C466	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V
C467	1-162-638-11	CERAMIC CHIP	1MF		16V
C468	1-162-638-11	CERAMIC CHIP	1MF		16V
C469	1-163-075-00	CERAMIC CHIP	0.047MF	10%	25V
C471	1-162-638-11	CERAMIC CHIP	1MF		16V
C472	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C473	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C474	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C475	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V
C476	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C477	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C478	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C479	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C480	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C481	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C483	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C501	1-136-718-11	FILM	0.1MF	5%	25V
C502	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C503	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C504	1-135-070-00	TANTAL. CHIP	0.1MF	20%	35V
C505	1-124-779-00	ELECT	10MF	20%	16V
C506	1-127-561-11	ELECT(SOLID)	33MF	20%	10V
C507	1-127-561-11	ELECT(SOLID)	33MF	20%	10V
C508	1-127-561-11	ELECT(SOLID)	33MF	20%	10V
C509	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C510	1-135-150-21	TANTAL. CHIP	3.3MF	10%	6.3V
C512	1-135-149-21	TANTAL. CHIP	2.2MF	20%	6.3V
C513	1-124-779-00	ELECT	10MF	20%	16V
C514	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C515	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C516	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C517	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V
C518	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C519	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C521	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C522	1-162-638-11	CERAMIC CHIP	1MF		16V
C523	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C524	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C525	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C526	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C527	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C528	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C529	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C531	1-162-966-11	CERAMIC CHIP	0.0022MF		50V
C532	1-163-023-00	CERAMIC CHIP	0.015MF		50V
C533	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C534	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C535	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C536	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C538	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C540	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C541	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C542	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V
C543	1-135-156-21	TANTAL. CHIP	6.8MF	20%	10V

Ref.No	Part No.	Description			Remark
C578	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C579	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C580	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C581	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C582	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C583	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C584	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C585	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C586	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C587	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C588	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C589	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C590	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C591	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C592	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C593	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C594	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C595	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V

CONNECTOR

CN311	1-566-531-11	CONNECTOR, FPC (ZIF) 15P
CN401	*1-566-181-11	PIN, CONNECTOR (PC BOARD) 2P
CN402	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P
CN403	1-566-538-31	CONNECTOR, FPC (NON ZIF) 6P
CN404	*1-566-183-11	PIN, CONNECTOR (PC BOARD) 4P
CN405	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P
CN406	*1-566-181-21	PIN, CONNECTOR (PC BOARD) 2P
CN407	*1-506-484-11	PIN, CONNECTOR 5P
CN409	1-566-532-11	CONNECTOR, FPC (ZIF) 16P
CN411	*1-566-185-11	PIN, CONNECTOR (PC BOARD) 6P
CN501	1-566-541-11	CONNECTOR, FPC (NON ZIF) 9P
CN503	*1-566-196-11	PIN, CONNECTOR (PC BOARD) 3P

DIODE

D401	8-719-404-40	DIODE MA121
D402	8-719-404-40	DIODE MA121
D403	8-719-404-40	DIODE MA121
D404	8-719-404-40	DIODE MA121
D405	8-719-404-40	DIODE MA121
D406	8-719-404-40	DIODE MA121
D407	8-719-404-46	DIODE MA110
D408	8-719-404-46	DIODE MA110
D501	8-719-938-75	DIODE SB05-05CPA
D502	8-719-938-75	DIODE SB05-05CPA
D503	8-719-938-75	DIODE SB05-05CPA

IC

IC311	8-752-033-38	IC CXA1202R
IC312	8-752-033-38	IC CXA1202R
IC401	8-752-809-31	IC CXP80116-105Q
IC402	8-759-940-79	IC S-81350AG
IC403	8-759-974-21	IC S-8054ALRS-LN1
IC404	8-759-100-94	IC UPC358G2
IC405	8-759-030-65	IC MPC1710AMR
IC406	8-759-100-94	IC UPC358G2
IC501	8-752-033-39	IC CXA1206M
IC502	8-759-030-39	IC JSCQ38507SD02R
IC503	8-759-107-68	IC CX20115A
IC504	8-759-805-06	IC CXA1127M
IC505	8-759-209-53	IC CXA1204Q
IC506	8-759-030-03	IC LM393M

COIL

L311	1-408-777-00	INDUCTOR CHIP 10UH
L312	1-412-033-11	INDUCTOR CHIP 220UH

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L313	1-412-029-11	INDUCTOR CHIP 10UH	
L314	1-412-029-11	INDUCTOR CHIP 10UH	
L315	1-412-033-11	INDUCTOR CHIP 220UH	
L316	1-412-033-11	INDUCTOR CHIP 220UH	
L317	1-410-385-11	INDUCTOR CHIP 22UH	
L318	1-410-385-11	INDUCTOR CHIP 22UH	
L401	1-412-031-11	INDUCTOR CHIP 47UH	
L402	1-412-030-11	INDUCTOR CHIP 22UH	
L501	1-410-658-21	INDUCTOR CHIP 220UH	
L502	1-408-795-21	INDUCTOR CHIP 330UH	
L503	1-412-032-21	INDUCTOR CHIP 100UH	
L504	1-412-032-21	INDUCTOR CHIP 100UH	
L505	1-412-031-11	INDUCTOR CHIP 47UH	

IC LINK

Ref.No	Part No.	Description	Remark
PS401 ⚠	1-532-685-11	LINK, IC (ICP-N20 800mA)	
PS402 ⚠	1-532-605-11	LINK, IC (ICP-N10 400mA)	
PS403 ⚠	1-532-605-11	LINK, IC (ICP-N10 400mA)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q311	8-729-173-38	TRANSISTOR 2SA733-K	
Q313	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q314	8-729-202-38	TRANSISTOR 2SC3326N	
Q315	8-729-202-38	TRANSISTOR 2SC3326N	
Q316	8-729-905-12	TRANSISTOR DTA144EU	
Q321	8-729-202-38	TRANSISTOR 2SC3326N	
Q322	8-729-202-38	TRANSISTOR 2SC3326N	
Q323	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q324	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q325	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q326	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q327	8-729-905-18	TRANSISTOR DTC144EU	
Q328	8-729-905-18	TRANSISTOR DTC144EU	
Q329	8-729-905-18	TRANSISTOR DTC144EU	
Q330	8-729-905-35	TRANSISTOR 2SC4081R	
Q401	8-729-403-24	TRANSISTOR XN4210	
Q402	8-729-403-24	TRANSISTOR XN4210	
Q403	8-729-403-24	TRANSISTOR XN4210	
Q404	8-729-403-24	TRANSISTOR XN4210	
Q405	8-729-403-24	TRANSISTOR XN4210	
Q407	8-729-403-24	TRANSISTOR XN4210	
Q408	8-729-403-24	TRANSISTOR XN4210	
Q409	8-729-403-24	TRANSISTOR XN4210	
Q410	8-729-403-24	TRANSISTOR XN4210	
Q411	8-729-905-12	TRANSISTOR DTA144EU	
Q412	8-729-905-18	TRANSISTOR DTC144EU	
Q413	8-729-905-18	TRANSISTOR DTC144EU	
Q414	8-729-920-39	TRANSISTOR IMT1US	
Q415	8-729-805-25	TRANSISTOR 2SB1121	
Q416	8-729-403-24	TRANSISTOR XN4210	
Q417	8-729-902-96	TRANSISTOR FMS1	
Q418	8-729-903-82	TRANSISTOR FMW2	
Q419	8-729-905-35	TRANSISTOR 2SC4081R	
Q420	8-729-902-96	TRANSISTOR FMS1	
Q421	8-729-902-96	TRANSISTOR FMS1	
Q422	8-729-905-35	TRANSISTOR 2SC4081R	
Q423	8-729-202-87	TRANSISTOR 2SA1242LB-Y	
Q424	8-729-905-18	TRANSISTOR DTC144EU	
Q425	8-729-901-04	TRANSISTOR DTA114EK	
Q426	8-729-900-53	TRANSISTOR DTC114EK	
Q427	8-729-905-18	TRANSISTOR DTC144EU	
Q428	8-729-905-12	TRANSISTOR DTA144EU	
Q429	8-729-403-24	TRANSISTOR XN4210	
Q435	8-729-903-97	TRANSISTOR FMS1	
Q436	8-729-902-93	TRANSISTOR FMG4	
Q501	8-729-920-39	TRANSISTOR IMT1US	
Q502	8-729-920-39	TRANSISTOR IMT1US	
Q503	8-729-920-39	TRANSISTOR IMT1US	
Q504	8-729-905-35	TRANSISTOR 2SC4081R	
Q506	8-729-905-23	TRANSISTOR 2SA1576R	
Q508	8-729-905-35	TRANSISTOR 2SC4081R	
Q509	8-729-905-23	TRANSISTOR 2SA1576R	
Q510	8-729-905-35	TRANSISTOR 2SC4081R	
Q511	8-729-905-23	TRANSISTOR 2SA1576R	
Q512	8-729-905-35	TRANSISTOR 2SC4081R	
Q515	8-729-905-23	TRANSISTOR 2SA1576R	
Q516	8-729-905-35	TRANSISTOR 2SC4081R	
Q522	8-729-904-04	TRANSISTOR FMS2	
Q524	8-729-903-82	TRANSISTOR FMW2	
Q525	8-729-807-16	TRANSISTOR 2SD1621	
Q526	8-729-905-35	TRANSISTOR 2SC4081R	
Q527	8-729-903-97	TRANSISTOR FMS1	

RESISTOR

Ref.No	Part No.	Description				Remark
R311	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R312	1-216-801-11	METAL GLAZE	22	5%	1/16W	
R315	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R316	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R317	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R318	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R319	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R320	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R321	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R322	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R323	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R324	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R325	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R326	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R327	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R328	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R329	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R330	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R331	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R332	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R333	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R334	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R336	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R337	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R338	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R339	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R340	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R341	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R342	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R343	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R344	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R345	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R346	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R347	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R348	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R350	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R351	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R352	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R353	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R354	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R358	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R359	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R360	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R361	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R362	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R363	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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Ref.No	Part No.	Description			Remark
R364	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R365	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R366	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R367	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R368	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R369	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R370	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R371	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R372	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R373	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R374	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R377	1-216-815-11	METAL GLAZE	330	5%	1/16W
R378	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R381	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R382	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R383	1-216-818-11	METAL GLAZE	560	5%	1/16W
R384	1-216-814-11	METAL GLAZE	270	5%	1/16W
R385	1-216-812-11	METAL GLAZE	180	5%	1/16W
R386	1-216-817-11	METAL GLAZE	470	5%	1/16W
R387	1-216-817-11	METAL GLAZE	470	5%	1/16W
R388	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R389	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R390	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R391	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R392	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R393	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R394	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R395	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R396	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R397	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R398	1-216-864-11	METAL GLAZE	0	5%	1/16W
R400	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R401	1-216-864-11	METAL GLAZE	0	5%	1/16W
R403	1-216-864-11	METAL GLAZE	0	5%	1/16W
R408	1-216-864-11	METAL GLAZE	0	5%	1/16W
R409	1-216-864-11	METAL GLAZE	0	5%	1/16W
R410	1-216-864-11	METAL GLAZE	0	5%	1/16W
R413	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R414	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R415	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R416	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R417	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R418	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R419	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R420	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R421	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R422	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R423	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R424	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R425	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R426	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R427	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R428	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R429	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R430	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R431	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R432	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R433	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R434	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R435	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R436	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R437	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R438	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R439	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R440	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R441	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R442	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R443	1-216-136-00	METAL GLAZE	2.7	5%	1/8W
R444	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R445	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R449	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R450	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R451	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R452	1-216-852-11	METAL GLAZE	390K	5%	1/16W
R453	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R454	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R455	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R456	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R457	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R458	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R459	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R460	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R461	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R462	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R463	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R464	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R465	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R466	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R467	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R468	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R469	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R470	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R471	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R472	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R473	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R474	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R475	1-216-816-11	METAL GLAZE	390	5%	1/16W
R476	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R477	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R478	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R479	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R480	1-216-194-00	METAL GLAZE	680	5%	1/8W
R481	1-216-194-00	METAL GLAZE	680	5%	1/8W
R482	1-216-194-00	METAL GLAZE	680	5%	1/8W
R483	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R484	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R485	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R486	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R487	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R488	1-216-176-00	METAL GLAZE	120	5%	1/8W
R489	1-216-174-00	METAL GLAZE	100	5%	1/8W
R490	1-216-817-11	METAL GLAZE	470	5%	1/16W
R491	1-216-817-11	METAL GLAZE	470	5%	1/16W
R492	1-216-817-11	METAL GLAZE	470	5%	1/16W
R493	1-216-817-11	METAL GLAZE	470	5%	1/16W
R494	1-216-864-11	METAL GLAZE	0	5%	1/16W
R495	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R496	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R501	1-216-336-11	METAL GLAZE	47K	1%	1/10W
R502	1-216-336-11	METAL GLAZE	47K	1%	1/10W
R503	1-216-101-00	METAL GLAZE	150K	1%	1/10W
R504	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R505	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R506	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R507	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R508	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R509	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R510	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R511	1-217-671-11	METAL GLAZE	1	5%	1/10W
R512	1-217-671-11	METAL GLAZE	1	5%	1/10W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R513	1-217-671-11	METAL GLAZE	1	5%	1/10W
R514	1-217-671-11	METAL GLAZE	1	5%	1/10W
R515	1-216-295-00	METAL GLAZE	0	5%	1/10W
R516	1-216-295-00	METAL GLAZE	0	5%	1/10W
R517	1-216-295-00	METAL GLAZE	0	5%	1/10W
R518	1-216-805-11	METAL GLAZE	47	5%	1/16W
R519	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R520	1-216-847-11	METAL GLAZE	150K	5%	1/16W
R521	1-216-846-11	METAL GLAZE	120K	5%	1/16W
R522	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R523	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R524	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R525	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R526	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R527	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R528	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R529	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R530	1-216-017-00	METAL GLAZE	47	5%	1/10W
R531	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R532	1-216-174-00	METAL GLAZE	100	5%	1/8W
R533	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R534	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R535	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R536	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R537	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R538	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R539	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R540	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R541	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R542	1-216-819-11	METAL GLAZE	680	5%	1/16W
R543	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R545	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R546	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R547	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R548	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R549	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R550	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R551	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R553	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R554	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R556	1-216-817-11	METAL GLAZE	470	5%	1/16W
R557	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R558	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R560	1-216-809-11	METAL GLAZE	100	5%	1/16W
R561	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R562	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R563	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R564	1-216-809-11	METAL GLAZE	100	5%	1/16W
R565	1-216-810-11	METAL GLAZE	120	5%	1/16W
R566	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R567	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R568	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R569	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R570	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R571	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R572	1-216-854-11	METAL GLAZE	560K	5%	1/16W
R573	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R574	1-216-687-11	METAL CHIP	33K	0.50%	1/10W
R575	1-218-150-11	METAL GLAZE	1.2K	1%	1/10W
R576	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R579	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R580	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R581	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R582	1-216-861-11	METAL GLAZE	2.2M	5%	1/16W
R583	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R584	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R586	1-216-847-11	METAL GLAZE	150K	5%	1/16W
R587	1-216-817-11	METAL GLAZE	470	5%	1/16W
R588	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R589	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R590	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R591	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R592	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R593	1-216-847-11	METAL GLAZE	150K	5%	1/16W
R595	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R596	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R597	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R598	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R599	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R601	1-216-789-11	METAL GLAZE	2.2	5%	1/16W
R602	1-216-789-11	METAL GLAZE	2.2	5%	1/16W
R603	1-216-789-11	METAL GLAZE	2.2	5%	1/16W
R604	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R605	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R607	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R608	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R609	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R610	1-217-671-11	METAL GLAZE	1	5%	1/10W
R611	1-217-671-11	METAL GLAZE	1	5%	1/10W
R614	1-216-835-11	METAL GLAZE	15K	5%	1/16W

VARIABLE RESISTOR

RV311	1-230-869-11	RES, ADJ, METAL GLAZE	4.7K
RV312	1-230-873-11	RES, ADJ, METAL GLAZE	47K
RV313	1-230-869-11	RES, ADJ, METAL GLAZE	4.7K
RV314	1-230-873-11	RES, ADJ, METAL GLAZE	47K
RV315	1-230-869-11	RES, ADJ, METAL GLAZE	4.7K
RV316	1-230-873-11	RES, ADJ, METAL GLAZE	47K
RV317	1-230-869-11	RES, ADJ, METAL GLAZE	4.7K
RV318	1-230-873-11	RES, ADJ, METAL GLAZE	47K
RV401	1-238-225-11	RES, ADJ, METAL GLAZE	47K
RV402	1-230-524-11	RES, ADJ, METAL GLAZE	22K
RV501	1-230-524-11	RES, ADJ, METAL GLAZE	22K
RV502	1-230-529-11	RES, ADJ, METAL GLAZE	470K

TESTPOINT

TP565	*1-535-622-11	PIN, TERMINAL
TP566	*1-535-622-11	PIN, TERMINAL

CRYSTAL

X401	1-577-116-21	VIBRATOR, CRYSTAL (16MHz)
X501	1-567-827-11	VIBRATOR, CRYSTAL (5.85938MHz)

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*A-7061-387-A VA-39 BOARD, COMPLETE

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(Ref. No. 2000 Series)

3-831-441-XX CUSHION

CAPACITOR

C001	1-124-779-00	ELECT	10MF	20%	16V
C002	1-126-159-11	ELECT	0.47MF	20%	50V
C003	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C004	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C005	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C006	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C007	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C008	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C009	1-126-159-11	ELECT	0.47MF	20%	50V
C010	1-126-157-11	ELECT	10MF	20%	16V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C011	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C012	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C013	1-124-229-00	ELECT	33MF	20%	6.3V
C015	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C016	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C017	1-124-779-00	ELECT	10MF	20%	16V
C018	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C019	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C020	1-126-246-11	ELECT	220MF	20%	4V
C021	1-126-161-11	ELECT	2.2MF	20%	50V
C022	1-124-254-00	ELECT	0.68MF	20%	50V
C023	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C024	1-124-779-00	ELECT	10MF	20%	16V
C025	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C026	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C027	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C028	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C029	1-126-205-11	ELECT	47MF	20%	6.3V
C030	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C031	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C032	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C033	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C034	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C036	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C037	1-162-967-11	CERAMIC CHIP	0.0033MF	10%	50V
C038	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C039	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C040	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C041	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C042	1-162-995-11	CERAMIC CHIP	0.022MF		50V
C044	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C045	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C046	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C047	1-135-070-00	TANTAL. CHIP	0.1MF	20%	35V
C048	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C049	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C050	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C051	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C052	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C053	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C054	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C055	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C056	1-126-193-11	ELECT	1MF	20%	50V
C057	1-126-193-11	ELECT	1MF	20%	50V
C058	1-126-193-11	ELECT	1MF	20%	50V
C059	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C060	1-126-193-11	ELECT	1MF	20%	50V
C061	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C062	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C063	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C064	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C065	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C066	1-135-147-21	TANTAL. CHIP	1MF	20%	20V
C067	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C068	1-126-157-11	ELECT	10MF	20%	16V
C069	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C070	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C071	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C072	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C073	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C074	1-163-986-00	CERAMIC CHIP	0.027MF	10%	25V
C075	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C076	1-162-966-11	CERAMIC CHIP	0.0022MF	10%	50V
C077	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C078	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C079	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C080	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C081	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C082	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C083	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C084	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C086	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C087	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C088	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C089	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C090	1-126-157-11	ELECT	10MF	20%	16V
C091	1-126-153-11	ELECT	22MF	20%	6.3V
C092	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C093	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C094	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C095	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C096	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C097	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C098	1-162-976-11	CERAMIC CHIP	75PF	5%	50V
C099	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C100	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C101	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C102	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C103	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C104	1-126-157-11	ELECT	10MF	20%	16V
C105	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C106	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C107	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C108	1-162-967-11	CERAMIC CHIP	0.0033MF	10%	50V
C109	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C110	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C111	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C112	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C113	1-126-160-11	ELECT	1MF	20%	50V
C114	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C115	1-126-156-11	ELECT	4.7MF	20%	16V
C116	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C117	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C118	1-126-153-11	ELECT	22MF	20%	6.3V
C119	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C120	1-126-157-11	ELECT	10MF	20%	16V
C121	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C122	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C123	1-126-160-11	ELECT	1MF	20%	50V
C124	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C125	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C126	1-126-100-11	ELECT	10MF	20%	6.3V
C127	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C128	1-126-157-11	ELECT	10MF	20%	16V
C129	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C130	1-126-157-11	ELECT	10MF	20%	16V
C131	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C132	1-126-157-11	ELECT	10MF	20%	16V
C133	1-126-157-11	ELECT	10MF	20%	16V
C134	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C135	1-126-157-11	ELECT	10MF	20%	16V
C136	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C137	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C138	1-126-157-11	ELECT	10MF	20%	16V
C139	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C140	1-126-157-11	ELECT	10MF	20%	16V
C141	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C142	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C143	1-126-157-11	ELECT	10MF	20%	16V
C144	1-162-953-11	CERAMIC CHIP	100PF	5%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C145	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C146	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C147	1-124-499-11	ELECT	1MF	20%	50V
C149	1-126-153-11	ELECT	22MF	20%	6.3V
C150	1-126-159-11	ELECT	0.47MF	20%	50V
C151	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C153	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C154	1-163-986-00	CERAMIC CHIP	0.027MF	10%	25V
C155	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C156	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C158	1-126-157-11	ELECT	10MF	20%	16V
C160	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C161	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C162	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C163	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C164	1-126-157-11	ELECT	10MF	20%	16V
C165	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C167	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C168	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C170	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C171	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C172	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C173	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C174	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C176	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C177	1-126-159-11	ELECT	0.47MF	20%	50V
C178	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C179	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C180	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C181	1-126-160-11	ELECT	1MF	20%	50V
C182	1-126-154-11	ELECT	47MF	20%	6.3V
C183	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C184	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C186	1-126-162-11	ELECT	3.3MF	20%	50V
C187	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C188	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C189	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C190	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C191	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C193	1-162-638-11	CERAMIC CHIP	1MF		16V
C194	1-126-100-11	ELECT	10MF	20%	6.3V
C195	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C196	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C197	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C198	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C199	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C200	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C201	1-126-160-11	ELECT	1MF	20%	50V
C202	1-126-160-11	ELECT	1MF	20%	50V
C203	1-162-969-11	CERAMIC CHIP	0.0068MF	10%	25V
C204	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C205	1-126-155-11	ELECT	100MF	20%	6.3V
C206	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C207	1-126-162-11	ELECT	3.3MF	20%	50V
C208	1-126-154-11	ELECT	47MF	20%	6.3V
C209	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C210	1-126-160-11	ELECT	1MF	20%	50V
C211	1-126-155-11	ELECT	100MF	20%	6.3V
C212	1-126-154-11	ELECT	47MF	20%	6.3V
C213	1-124-239-00	ELECT	6.8MF	20%	25V
C214	1-126-155-11	ELECT	100MF	20%	6.3V
C215	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C216	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C217	1-126-153-11	ELECT	22MF	20%	6.3V
C218	1-126-161-11	ELECT	2.2MF	20%	50V

Ref.No	Part No.	Description			Remark
C219	1-126-154-11	ELECT	47MF	20%	6.3V
C220	1-126-154-11	ELECT	47MF	20%	6.3V
C221	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C222	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C223	1-162-995-11	CERAMIC CHIP	0.022MF		50V
C224	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C225	1-126-159-11	ELECT	0.47MF	20%	50V
C226	1-162-965-11	CERAMIC CHIP	0.0015MF	10%	50V
C227	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C228	1-163-016-00	CERAMIC CHIP	0.0039MF	10%	50V
C229	1-162-966-11	CERAMIC CHIP	0.0022MF	10%	50V
C230	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C231	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C232	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C233	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V
C234	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C235	1-162-587-91	CERAMIC CHIP	0.039MF	10%	25V
C236	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C237	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C238	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V
C239	1-126-160-11	ELECT	1MF	20%	50V
C240	1-126-157-11	ELECT	10MF	20%	16V
C241	1-126-157-11	ELECT	10MF	20%	16V
C242	1-126-153-11	ELECT	22MF	20%	6.3V
C243	1-126-161-11	ELECT	2.2MF	20%	50V
C244	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C245	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C246	1-162-966-11	CERAMIC CHIP	0.0022MF	10%	50V
C248	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C249	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C250	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C251	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C252	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C254	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C255	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C256	1-162-957-11	CERAMIC CHIP	220PF	5%	50V

CONNECTOR

CN001	1-566-538-31	CONNECTOR, FPC (NON ZIF) 6P
CN002	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P
CN004	*1-566-183-11	PIN, CONNECTOR (PC BOARD) 4P
CN005	*1-566-876-11	PIN, CONNECTOR (PC BOARD) 4P
CN201	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P

TRIMMER

CT001	1-141-331-11	CAP, VAR, TRIMMER (CHIP)
CT002	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

DIODE

D001	8-719-101-23	DIODE 1SS123
D002	8-719-101-23	DIODE 1SS123
D003	8-713-220-00	DIODE 1T32-2
D004	8-719-404-46	DIODE MA110
D005	9-984-558-01	DIODE MA153
D006	9-984-558-01	DIODE MA153
D007	8-719-420-15	DIODE MA8082-M
D008	9-984-558-01	DIODE MA153
D009	8-719-404-46	DIODE MA110
D010	8-719-101-23	DIODE 1SS123
D011	8-719-404-35	DIODE MA141WK
D020	8-719-404-46	DIODE MA110

FILTER

FL001	1-577-162-11	FILTER, CERAMIC
FL002	1-236-186-21	FILTER, BAND PASS

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark
FL003	1-409-446-21	FILTER, TRAP	
FL005	1-236-188-21	FILTER, BAND PASS	
FL006	1-415-593-11	DELAY LINE, ULTRASONIC GLASS	
FL201	1-236-145-11	FILTER, BAND PASS	

IC

Ref.No	Part No.	Description	Remark
IC001	8-752-033-40	IC CXA1201Q	
IC002	8-752-324-87	C CXL1502M	
IC003	8-752-034-40	IC CXA1200BQ	
IC004	8-759-710-09	IC NJM2233AM	
IC005	8-759-710-09	IC NJM2233AM	
IC006	8-759-140-26	IC UPD6145G-601	
IC007	8-759-605-61	IC CXA1203N	
IC008	8-759-009-22	IC MC14094BF	
IC009	8-759-970-80	IC MB673198U	
IC201	8-752-033-01	IC CXA1237AR	

COIL

Ref.No	Part No.	Description	Remark
L002	1-410-393-11	INDUCTOR CHIP 100UH	
L003	1-410-393-11	INDUCTOR CHIP 100UH	
L004	1-412-031-11	INDUCTOR CHIP 47UH	
L005	1-412-031-11	INDUCTOR CHIP 47UH	
L006	1-412-029-11	INDUCTOR CHIP 10UH	
L008	1-410-385-11	INDUCTOR CHIP 22UH	
L009	1-410-383-11	INDUCTOR CHIP 15UH	
L010	1-410-393-11	INDUCTOR CHIP 100UH	
L011	1-408-797-11	INDUCTOR CHIP 470UH	
L012	1-410-393-11	INDUCTOR CHIP 100UH	
L013	1-410-390-11	INDUCTOR CHIP 56UH	
L014	1-410-377-11	INDUCTOR CHIP 4.7UH	
L015	1-408-797-11	INDUCTOR CHIP 470UH	
L016	1-408-795-21	INDUCTOR CHIP 330UH	
L017	1-408-792-00	INDUCTOR CHIP 180UH	
L018	1-410-387-11	INDUCTOR CHIP 33UH	
L020	1-410-381-11	INDUCTOR CHIP 10UH	
L021	1-412-029-11	INDUCTOR CHIP 10UH	
L022	1-410-393-11	INDUCTOR CHIP 100UH	
L023	1-410-380-21	INDUCTOR CHIP 8.2UH	
L024	1-408-795-21	INDUCTOR CHIP 330UH	
L025	1-408-790-00	INDUCTOR CHIP 120UH	
L026	1-408-791-00	INDUCTOR CHIP 150UH	
L027	1-410-393-11	INDUCTOR CHIP 100UH	
L028	1-410-387-11	INDUCTOR CHIP 33UH	
L031	1-408-795-21	INDUCTOR CHIP 330UH	
L032	1-410-388-21	INDUCTOR CHIP 39UH	
L033	1-410-389-11	INDUCTOR CHIP 47UH	
L034	1-410-389-11	INDUCTOR CHIP 47UH	
L035	1-410-381-11	INDUCTOR CHIP 10UH	
L036	1-410-388-21	INDUCTOR CHIP 39UH	
L038	1-410-393-11	INDUCTOR CHIP 100UH	
L039	1-412-026-11	INDUCTOR CHIP 1UH	
L040	1-410-387-11	INDUCTOR CHIP 33UH	
L041	1-410-381-11	INDUCTOR CHIP 10UH	
L042	1-410-389-11	INDUCTOR CHIP 47UH	
L201	1-410-393-11	INDUCTOR CHIP 100UH	
L202	1-410-658-21	INDUCTOR CHIP 220UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q001	8-729-301-98	TRANSISTOR 2SB1000AK	
Q002	8-729-905-23	TRANSISTOR 2SA1576R	
Q003	8-729-905-23	TRANSISTOR 2SA1576R	
Q004	8-729-402-78	TRANSISTOR XN6401	
Q005	8-729-905-23	TRANSISTOR 2SA1576R	
Q006	8-729-905-23	TRANSISTOR 2SA1576R	
Q007	8-729-905-12	TRANSISTOR DTA144EU	
Q008	8-729-905-35	TRANSISTOR 2SC4081R	

Ref.No	Part No.	Description	Remark
Q009	8-729-301-98	TRANSISTOR 2SB1000AL	
Q010	8-729-905-35	TRANSISTOR 2SC4081R	
Q011	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q012	8-729-905-23	TRANSISTOR 2SA1576R	
Q013	8-729-905-23	TRANSISTOR 2SA1576R	
Q014	8-729-905-35	TRANSISTOR 2SC4081R	
Q015	8-729-905-35	TRANSISTOR 2SC4081R	
Q016	8-729-905-35	TRANSISTOR 2SC4081R	
Q017	8-729-905-35	TRANSISTOR 2SC4081R	
Q018	8-729-905-35	TRANSISTOR 2SC4081R	
Q019	8-729-905-35	TRANSISTOR 2SC4081R	
Q020	8-729-905-35	TRANSISTOR 2SC4081R	
Q021	8-729-905-35	TRANSISTOR 2SC4081R	
Q022	8-729-905-35	TRANSISTOR 2SC4081R	
Q023	8-729-801-19	TRANSISTOR 2SB815	
Q024	8-729-905-15	TRANSISTOR DTC144WU	
Q025	8-729-905-23	TRANSISTOR 2SA1576R	
Q026	8-729-905-35	TRANSISTOR 2SC4081R	
Q027	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q028	8-729-905-35	TRANSISTOR 2SC4081R	
Q030	8-729-905-12	TRANSISTOR DTA144EU	
Q031	8-729-420-12	TRANSISTOR XN4213	
Q032	8-729-905-35	TRANSISTOR 2SC4081R	
Q033	8-729-905-23	TRANSISTOR 2SA1576R	
Q034	8-729-122-63	TRANSISTOR 2SA1226	
Q035	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q036	8-729-905-35	TRANSISTOR 2SC4081R	
Q037	8-729-905-35	TRANSISTOR 2SC4081R	
Q038	8-729-905-18	TRANSISTOR DTC144EU	
Q039	8-729-905-35	TRANSISTOR 2SC4081R	
Q040	8-729-905-23	TRANSISTOR 2SA1576R	
Q041	8-729-905-23	TRANSISTOR 2SA1576R	
Q042	8-729-905-35	TRANSISTOR 2SC4081R	
Q043	8-729-905-35	TRANSISTOR 2SC4081R	
Q044	8-729-905-15	TRANSISTOR DTC144WU	
Q045	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q046	8-729-905-35	TRANSISTOR 2SC4081R	
Q047	8-729-905-35	TRANSISTOR 2SC4081R	
Q048	8-729-905-23	TRANSISTOR 2SA1576R	
Q049	8-729-905-35	TRANSISTOR 2SC4081R	
Q050	8-729-905-35	TRANSISTOR 2SC4081R	
Q051	8-729-905-23	TRANSISTOR 2SA1576R	
Q052	8-729-905-35	TRANSISTOR 2SC4081R	
Q054	8-729-905-35	TRANSISTOR 2SC4081R	
Q056	8-729-905-23	TRANSISTOR 2SA1576R	
Q058	8-729-905-18	TRANSISTOR DTC144EU	
Q059	8-729-905-18	TRANSISTOR DTC144EU	
Q060	8-729-905-12	TRANSISTOR DTA144EU	
Q061	8-729-402-81	TRANSISTOR XN4501	
Q062	8-729-420-12	TRANSISTOR XN4213	
Q063	8-729-905-12	TRANSISTOR DTA144EU	
Q064	8-729-905-23	TRANSISTOR 2SA1576R	
Q065	8-729-905-23	TRANSISTOR 2SA1576R	
Q066	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q067	8-729-402-78	TRANSISTOR XN6401	
Q068	8-729-905-35	TRANSISTOR 2SC4081R	
Q070	8-729-905-12	TRANSISTOR DTA144EU	
Q071	8-729-905-15	TRANSISTOR DTC144WU	
Q072	8-729-301-98	TRANSISTOR 2SB1000AL	
Q073	8-729-905-18	TRANSISTOR DTC144EU	
Q074	8-729-905-12	TRANSISTOR DTA144EU	
Q075	8-729-905-35	TRANSISTOR 2SC4081R	
Q076	8-729-905-23	TRANSISTOR 2SA1576R	
Q077	8-729-905-35	TRANSISTOR 2SC4081R	
Q078	8-729-905-35	TRANSISTOR 2SC4081R	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
Q079	8-729-905-35	TRANSISTOR 2SC4081R				
Q080	8-729-905-23	TRANSISTOR 2SA1576R				
Q081	8-729-100-67	TRANSISTOR 2SC1623				
Q082	8-729-905-23	TRANSISTOR 2SA1576R				
Q083	8-729-905-23	TRANSISTOR 2SA1576R				
Q085	8-729-907-00	TRANSISTOR DTC114EU				
Q086	8-729-905-12	TRANSISTOR DTA144EU				
Q201	8-729-905-35	TRANSISTOR 2SC4081R				
Q202	8-729-905-35	TRANSISTOR 2SC4081R				
Q203	8-729-905-12	TRANSISTOR DTA144EU				
Q204	8-729-116-05	TRANSISTOR 2SK160-K5				
		RESISTOR				
R001	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R002	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R003	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R004	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R005	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R006	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R007	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R008	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R009	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R010	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R011	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R012	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R013	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R014	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R015	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R016	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R017	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R018	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R019	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R020	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R021	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R022	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R023	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R024	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R025	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R026	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R027	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R028	1-216-022-00	METAL GLAZE	75	5%	1/10W	
R029	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R030	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R031	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R032	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R033	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R034	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R035	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R036	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R037	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R038	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R039	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R040	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R041	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R042	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R043	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R044	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R045	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R046	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R047	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R048	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R049	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R050	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R051	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R052	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R053	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R054	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R055	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R056	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R057	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R058	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R059	1-216-816-11	METAL GLAZE	390	5%	1/16W	
R060	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R061	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R062	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R063	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R064	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R065	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R066	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R067	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R068	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R069	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R070	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R071	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R072	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R073	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R074	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R075	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R076	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R077	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R078	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R079	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R080	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R081	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R082	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R083	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R084	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R085	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R086	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R087	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R088	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R089	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R090	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R091	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R092	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R093	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R094	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R095	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R096	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R097	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R098	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R099	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R100	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R101	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R102	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R103	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R104	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R105	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R106	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R107	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R108	1-216-808-11	METAL GLAZE	82	5%	1/16W	
R109	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R110	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R111	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R112	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R113	1-216-816-11	METAL GLAZE	390	5%	1/16W	
R114	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R116	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R117	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R118	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R119	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R120	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R121	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R122	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R123	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R124	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R125	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R126	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R127	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R128	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R129	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R130	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R131	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R132	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R133	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R134	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R136	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R137	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R138	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R139	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R140	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R141	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R142	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R143	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R144	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R145	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R147	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R148	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R149	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R150	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R151	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R152	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R153	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R154	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R155	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R156	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R157	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R159	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R160	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R161	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R162	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R163	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R164	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R165	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R166	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R167	1-216-855-11	METAL GLAZE	680K	5%	1/16W	
R168	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R169	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R170	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R171	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R172	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R173	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R174	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R175	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R176	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R177	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R178	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R179	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R181	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R182	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R183	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R184	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R186	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R188	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R189	1-216-857-11	METAL GLAZE	1M	5%	1/16W	

Ref.No	Part No.	Description				Remark
R190	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R191	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R192	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R193	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R194	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R196	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R197	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R198	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R199	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R200	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R201	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R202	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R203	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R204	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R205	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R206	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R210	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R211	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R212	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R213	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R214	1-216-803-11	METAL GLAZE	33	5%	1/16W	
R215	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R216	1-216-848-11	METAL GLAZE	180K	5%	1/16W	
R217	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R218	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R219	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R220	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R221	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R222	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R223	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R224	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R225	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R226	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R227	1-249-416-11	CARBON	820	5%	1/4W	
R228	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R229	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R230	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R231	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R232	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R233	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R234	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R235	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R236	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R237	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R241	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R242	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R243	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R244	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R249	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R250	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R252	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R253	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R254	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R255	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R256	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R257	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R258	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R259	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R260	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R262	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R263	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R264	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R266	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R267	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R268	1-216-837-11	METAL GLAZE	22K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R269	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R270	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R271	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R272	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R273	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R274	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R275	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R277	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R278	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R279	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R280	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R281	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R282	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R283	1-216-807-11	METAL GLAZE	68	5%	1/16W
R284	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R285	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R286	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R287	1-216-819-11	METAL GLAZE	680	5%	1/16W
R288	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R289	1-216-813-11	METAL GLAZE	220	5%	1/16W
R290	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R291	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R292	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R294	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R295	1-216-817-11	METAL GLAZE	470	5%	1/16W
R296	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R297	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R298	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R299	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R650	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R651	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R652	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R653	1-216-820-11	METAL GLAZE	820	5%	1/16W
R654	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R655	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R656	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R657	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R658	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R659	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R660	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R661	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R662	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R663	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R664	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R665	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R666	1-216-296-00	METAL GLAZE	0	5%	1/8W
R667	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R668	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R669	1-216-864-11	METAL GLAZE	0	5%	1/16W
R670	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R671	1-216-833-11	METAL GLAZE	10K	5%	1/6W

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV001	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV002	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV003	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV004	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV005	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV006	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV007	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV008	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV009	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV010	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV012	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV013	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV014	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV201	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV202	1-230-871-11	RES, ADJ, METAL GLAZE 22K	
RV203	1-230-870-11	RES, ADJ, METAL GLAZE 10K	

CRYSTAL

Ref.No	Part No.	Description
X001	1-577-117-21	VIBRATOR, CRYSTAL (4.43MHz)

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*A-7068-132-A DD-7 BOARD, COMPLETE

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(Ref. No. 4000 Series)

CAPACITOR

Ref.No	Part No.	Description			
C551	1-124-589-11	ELECT	47MF	20%	16V
C552	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C553	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C554	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C555	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C556	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C557	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C558	1-124-589-11	ELECT	47MF	20%	16V
C559	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C560	1-163-061-00	CERAMIC CHIP	0.015MF	10%	50V
C561	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C562	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C563	1-135-072-21	TANTAL. CHIP	0.22MF	10%	35V
C564	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C565	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C566	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C567	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C568	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C569	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C570	1-127-558-11	ELECT(SOLID)	10MF	20%	10V
C572	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V

DIODE

Ref.No	Part No.	Description
D551	8-719-938-78	DIODE SB10-05PCP
D552	8-719-404-32	DIODE MA141WA
D553	8-719-938-75	DIODE SB05-05CP
D554	8-719-938-75	DIODE SB05-05CP

IC

Ref.No	Part No.	Description
IC551	8-759-945-17	IC MB3775PF
IC552	8-759-710-11	IC NJM311M

COIL

Ref.No	Part No.	Description
L551	1-424-104-11	COIL, CHOKE 10UH
L552	1-424-104-11	COIL, CHOKE 10UH
L553	1-424-105-11	COIL, CHOKE 22UH
L554	1-424-105-11	COIL, CHOKE 22UH
L555	1-424-106-11	COIL, CHOKE 47UH
L556	1-412-031-11	INDUCTOR CHIP 47UH
L557	1-412-027-11	INDUCTOR CHIP 2.2UH

TRANSISTOR

Ref.No	Part No.	Description
Q551	8-729-901-04	TRANSISTOR DTA114EK
Q552	8-729-905-18	TRANSISTOR DTC144EU
Q553	8-729-805-25	TRANSISTOR 2SB1121
Q554	8-729-119-83	TRANSISTOR 2SC4175
Q555	8-729-805-25	TRANSISTOR 2SB1121
Q556	8-729-119-83	TRANSISTOR 2SC4175
Q557	8-729-805-25	TRANSISTOR 2SB1121
Q558	8-729-119-83	TRANSISTOR 2SC4175
Q559	8-729-905-61	TRANSISTOR DTC124EU

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
Q560	8-729-107-43	TRANSISTOR 2SC3624-L18				

RESISTOR

Ref.No	Part No.	Description				Remark
R551	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R552	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R553	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R554	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R555	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R556	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R557	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R558	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R559	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R560	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R561	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R562	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R563	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R564	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R565	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R566	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R567	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R568	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R569	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV551	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV552	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	

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*A-7061-238-A FP-115 BOARD, COMPLETE

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(Ref. No. 5000 Series)

Ref.No	Part No.	Description	Remark
	3-727-954-01	HOLDER (T), SENSOR	
	3-727-954-01	HOLDER (S), SENSOR	

DIODE

Ref.No	Part No.	Description	Remark
D991	8-719-951-03	DIODE GL453	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q991	8-729-907-25	PHOTO TRANSISTOR PT4850F	
Q992	8-729-907-25	PHOTO TRANSISTOR PT4850F	

RESISTOR

Ref.No	Part No.	Description				Remark
R991	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R992	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R993	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R994	1-216-817-11	METAL GLAZE	470	5%	1/16W	

SWITCH

Ref.No	Part No.	Description	Remark
S991	1-554-938-11	SWITCH, LEAF(C LOCK)	
S992	1-571-647-11	SWITCH, PUSH(2 KEY)(ME/MP, REC PROOF)	

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A-7061-390-A FU-61P BOARD, COMPLETE

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(Ref. No. 6000 Series)

CAPACITOR

Ref.No	Part No.	Description				Remark
C595	1-126-416-11	ELECT	220MF	20%	10V	
C596	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	
C597	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	

COIL

Ref.No	Part No.	Description		Remark
L595	1-410-337-11	INDUCTOR	1UH	
L596	1-410-337-11	INDUCTOR	1UH	

IC LINK

Ref.No	Part No.	Description	Remark
PS595 ⚠	1-532-841-21	LINK, IC (PRF-1600 1.6A)	
PS596 ⚠	1-532-841-21	LINK, IC (PRF-1600 1.6A)	
PS597 ⚠	1-532-841-21	LINK, IC (PRF-1600 1.6A)	

SWITCH

Ref.No	Part No.	Description	Remark
S595	1-571-102-11	SWITCH, SLIDE (EJECT)	

BATTERY TERMINAL

Ref.No	Part No.	Description	Remark
W599	1-535-658-11	TERMINAL BOARD (BATTERY)	

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*A-7061-391-A VC-32P BOARD, COMPLETE

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(Ref. No. 1000 Series)

Ref.No	Part No.	Description	Remark
	A-7068-139-A	CP-20P BOARD, COMPLETE (HIC)	
	A-7068-140-A	DT-70P BOARD, COMPLETE (HIC)	
	1-627-613-11	FP-95 FLEXIBLE BOARD	

CAPACITOR

Ref.No	Part No.	Description				Remark
C611	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V	
C612	1-126-205-11	ELECT	47MF	20%	6.3V	
C615	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C616	1-163-036-00	CERAMIC CHIP	0.068MF		50V	
C618	1-135-079-21	TANTAL. CHIP	3.3MF	20%	35V	
C619	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C620	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C621	1-126-200-11	ELECT	10MF	20%	35V	
C622	1-163-036-00	CERAMIC CHIP	0.068MF		50V	
C623	1-163-036-00	CERAMIC CHIP	0.068MF		50V	
C624	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C625	1-135-089-21	TANTAL. CHIP	6.8MF	20%	20V	
C626	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C627	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C628	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C629	1-162-974-11	CERAMIC CHIP	0.01MF		50V	
C631	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C633	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C634	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C635	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V	
C636	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C637	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V	
C638	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C639	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C640	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C641	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C643	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C644	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C645	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C646	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C647	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C648	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V	
C650	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	
C651	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	
C652	1-162-922-11	CERAMIC CHIP	39PF	5%	50V	
C653	1-164-005-11	CERAMIC CHIP	0.47MF		25V	
C654	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V	
C655	1-135-155-21	TANTAL. CHIP	4.7MF	20%	10V	
C656	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C657	1-162-974-11	CERAMIC CHIP	0.01MF		50V	
C658	1-163-077-00	CERAMIC CHIP	0.1MF		50V	
C659	1-164-156-11	CERAMIC CHIP	0.1MF		25V	
C660	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C661	1-124-566-11	ELECT	120MF	20%	6.3V	

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description			Remark
C662	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C663	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C664	1-162-638-11	CERAMIC CHIP	1MF		16V
C665	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C666	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C667	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C668	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C669	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C670	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C671	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C672	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C673	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C674	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C675	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C676	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C677	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C678	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C679	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C680	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C681	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C682	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C683	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C684	1-135-072-21	TANTAL. CHIP	0.22MF	20%	35V
C685	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C686	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V
C687	1-162-638-11	CERAMIC CHIP	1MF		16V
C690	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C695	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C696	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C697	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C698	1-126-200-11	ELECT	10MF	20%	35V
C699	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C700	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C701	1-124-943-11	ELECT	39MF	20%	25V
C702	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C703	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C704	1-126-204-11	ELECT	47MF	20%	16V
C708	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C709	1-126-205-11	ELECT	47MF	20%	6.3V
C710	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C711	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C736	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C737	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C738	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C739	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C740	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C741	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C742	1-124-778-00	ELECT	22MF	20%	6.3V
C743	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C744	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V
C745	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C750	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V
C755	1-162-974-11	CERAMIC CHIP	0.01MF		50V

CONNECTOR

CN611	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P
CN612	*1-565-547-11	PIN, CONNECTOR (PC BOARD) 8P
CN613	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P

TRIMMER

CT611	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

DIODE

Ref.No	Part No.	Description	Remark
D611	8-719-404-46	DIODE MA110	
D614	8-719-404-32	DIODE MA141WA	
D615	8-719-404-49	DIODE MA111	
D616	8-719-404-49	DIODE MA111	
D618	8-719-404-46	DIODE MA110	
D619	8-719-404-46	DIODE MA110	
D620	8-719-404-32	DIODE MA141WA	
D621	8-719-404-35	DIODE MA141WK	
D622	8-713-220-00	DIODE 1T32-1	
D623	8-719-404-46	DIODE MA110	

DELAY LINE

DL611	1-415-554-21	DELAY LINE, LC

FILTER

FL611	1-236-065-21	FILTER, LOW PASS (PAL)

IC

IC611	8-752-326-08	IC CXD1159Q
IC612	8-752-033-70	IC CXA1072R
IC613	8-759-946-00	IC MB88341PFV
IC614	8-759-106-23	IC UPD4066BG
IC615	8-759-100-95	IC UPC324G2
IC616	8-759-031-34	IC MC68HC05N2FU
IC617	8-759-937-56	IC S-8054ALB-LM-S
IC618	8-759-101-12	IC UPC311G2

COIL

L611	1-410-180-51	INDUCTOR CHIP 0.1UH
L612	1-410-180-51	INDUCTOR CHIP 0.1UH
L613	1-410-180-51	INDUCTOR CHIP 0.1UH
L614	1-410-204-31	INDUCTOR CHIP 10UH
L615	1-412-026-11	INDUCTOR CHIP 1UH
L616	1-412-029-11	INDUCTOR CHIP 10UH
L617	1-412-029-11	INDUCTOR CHIP 10UH
L618	1-410-192-51	INDUCTOR CHIP 1UH
L619	1-421-904-21	COIL, CHOKE 47UH
L620	1-412-029-11	INDUCTOR CHIP 10UH
L621	1-412-029-11	INDUCTOR CHIP 10UH
L622	1-412-029-11	INDUCTOR CHIP 10UH
L623	1-412-032-21	INDUCTOR CHIP 100UH
L624	1-410-393-11	INDUCTOR CHIP 100UH
L625	1-412-029-11	INDUCTOR CHIP 10UH
L626	1-412-031-11	INDUCTOR CHIP 47UH

TRANSISTOR

Q611	8-729-402-84	TRANSISTOR XN4601
Q612	8-729-402-84	TRANSISTOR XN4601
Q613	8-729-402-84	TRANSISTOR XN4601
Q614	8-729-402-78	TRANSISTOR XN6401
Q615	8-729-403-10	TRANSISTOR XN6215
Q616	8-729-905-35	TRANSISTOR 2SC4081R
Q618	8-729-402-84	TRANSISTOR XN4601
Q619	8-729-402-84	TRANSISTOR XN4601
Q620	8-729-905-23	TRANSISTOR 2SA1576R
Q621	8-729-905-35	TRANSISTOR 2SC4081R
Q624	8-729-402-84	TRANSISTOR XN4601
Q625	8-729-103-72	TRANSISTOR 2SD1005
Q626	8-729-104-26	TRANSISTOR 2SB804-AW
Q627	8-729-402-84	TRANSISTOR XN4601
Q628	8-729-402-13	TRANSISTOR XN1501
Q629	8-729-905-35	TRANSISTOR 2SC4081R
Q630	8-729-905-35	TRANSISTOR 2SC4081R
Q631	8-729-403-07	TRANSISTOR XN1213
Q632	8-729-403-10	TRANSISTOR XN6215
Q633	8-729-905-35	TRANSISTOR 2SC4081R

When indicating parts by reference number, please include the board name.

VC-32P

Ref.No	Part No.	Description			Remark
Q634	8-729-905-23	TRANSISTOR 2SA1576R			
Q635	8-729-403-10	TRANSISTOR XN6215			
Q636	8-729-905-23	TRANSISTOR 2SA1576R			
Q637	8-729-905-35	TRANSISTOR 2SC4081R			
Q638	8-729-402-84	TRANSISTOR XN4601			
Q639	8-729-402-84	TRANSISTOR XN4601			
Q640	8-729-905-23	TRANSISTOR 2SA1576R			
Q641	8-729-402-78	TRANSISTOR XN6401			
		RESISTOR			
R611	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R612	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W
R613	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R614	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W
R615	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R616	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R618	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R619	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R620	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R621	1-216-820-11	METAL GLAZE	820	5%	1/16W
R623	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R624	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R625	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R626	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R627	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R628	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R629	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R630	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R631	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R632	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R633	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R634	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R635	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R636	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R637	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R638	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R639	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R640	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R641	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R642	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R643	1-216-689-11	METAL CHIP	39K	0.50%	1/10W
R644	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R645	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R646	1-216-809-11	METAL GLAZE	100	5%	1/16W
R647	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R648	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R649	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R650	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R651	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R652	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R653	1-216-005-00	METAL GLAZE	15	5%	1/10W
R654	1-216-005-00	METAL GLAZE	15	5%	1/10W
R655	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R656	1-216-853-11	METAL GLAZE	470K	5%	1/16W
R657	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R658	1-216-852-11	METAL GLAZE	390K	5%	1/16W
R659	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R660	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R661	1-216-813-11	METAL GLAZE	220	5%	1/16W
R664	1-216-864-11	METAL GLAZE	0	5%	1/16W
R666	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R667	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R668	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R669	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R670	1-216-848-11	METAL GLAZE	180K	5%	1/16W
R671	1-216-809-11	METAL GLAZE	100	5%	1/16W
R672	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R673	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R674	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R675	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R676	1-216-864-11	METAL GLAZE	0	5%	1/16W
R677	1-216-809-11	METAL GLAZE	100	5%	1/16W
R678	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R679	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R680	1-216-864-11	METAL GLAZE	0	5%	1/16W
R681	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R682	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R685	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R686	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R687	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R688	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R689	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R690	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R691	1-216-864-11	METAL GLAZE	0	5%	1/16W
R694	1-216-864-11	METAL GLAZE	0	5%	1/16W
R695	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R696	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R697	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R698	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R699	1-216-864-11	METAL GLAZE	0	5%	1/16W
R700	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R701	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R702	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R703	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R704	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R705	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R706	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R707	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R708	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R709	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R710	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R711	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R712	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R713	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R714	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R715	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R716	1-216-846-11	METAL GLAZE	120K	5%	1/16W
R717	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R718	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R719	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R720	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R723	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R730	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R731	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R732	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R733	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R734	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R736	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R739	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R740	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R741	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R742	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R745	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R747	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R750	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R751	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R752	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R753	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R754	1-216-847-11	METAL GLAZE	150K	5%	1/16W
R755	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R757	1-216-833-11	METAL GLAZE	10K	5%	1/16W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R758	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R759	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R767	1-216-813-11	METAL GLAZE	220	5%	1/16W
R768	1-216-809-11	METAL GLAZE	100	5%	1/16W
R769	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R770	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R771	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R772	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R773	1-216-864-11	METAL GLAZE	0	5%	1/16W
R775	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R776	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R777	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R778	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R779	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R780	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R781	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R782	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R783	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R784	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R785	1-216-813-11	METAL GLAZE	220	5%	1/16W
R786	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R787	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R788	1-216-813-11	METAL GLAZE	220	5%	1/16W
R789	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R790	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R796	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R798	1-216-864-11	METAL GLAZE	0	5%	1/16W
R799	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R800	1-216-833-11	METAL GLAZE	10K	5%	1/16W

CRYSTAL

X611	1-577-119-11	OSCILLATOR, CRYSTAL (28.375MHz)
X612	1-567-733-11	VIBRATOR, CRYSTAL (17MHz)
X613	1-577-118-11	VIBRATOR, LITHIUM NIOBATE (4MHz)

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*A-7061-394-A AF-36P BOARD, COMPLETE
****
(Ref. No. 4000 Series)

1-627-620-11 FP-125 FLEXIBLE BOARD

CAPACITOR

Ref.No	Part No.	Description			Remark
C801	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C802	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C803	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C804	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C805	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C806	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C807	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C808	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C809	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C810	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C811	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C812	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C813	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C814	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C815	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C816	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C817	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C818	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C819	1-162-966-11	CERAMIC CHIP	0.0022MF	10%	50V
C820	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C821	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C822	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C823	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C824	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C825	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C826	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C827	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C828	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C829	1-135-148-21	TANTAL. CHIP	1.5MF	20%	16V
C830	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C831	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C832	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C833	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C834	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C835	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C836	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C837	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C838	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C839	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C840	1-162-962-11	CERAMIC CHIP	470PF	10%	50V

CONNECTOR

CN801	1-565-728-11	CONNECTOR, FPC 17P
CN802	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P
CN803	*1-565-542-21	PIN, CONNECTOR (PC BOARD) 3P
CN804	1-566-536-11	CONNECTOR, FPC (ZIF) 20P
CN805	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P

FILTER

FL801	1-236-209-11	FILTER, LOW PASS

IC

IC801	8-752-326-18	IC CXD1204R
IC802	8-759-030-98	IC MC68HC05C4FU
IC803	8-759-971-93	IC MSM6219GS-VK
IC804	8-759-946-00	IC MB88341PFV
IC805	8-759-100-95	IC UPC324G2

COIL

L801	1-410-192-51	INDUCTOR CHIP 1UH

TRANSISTOR

Q801	8-729-403-10	TRANSISTOR XN6215
Q802	8-729-905-35	TRANSISTOR 2SC4081R
Q803	8-729-905-35	TRANSISTOR 2SC4081R
Q804	8-729-905-23	TRANSISTOR 2SA1576R
Q805	8-729-905-35	TRANSISTOR 2SC4081R
Q806	8-729-905-35	TRANSISTOR 2SC4081R
Q807	8-729-905-35	TRANSISTOR 2SC4081R
Q808	8-729-905-23	TRANSISTOR 2SA1576R
Q809	8-729-905-23	TRANSISTOR 2SA1576R
Q810	8-729-402-84	TRANSISTOR XN4601
Q811	8-729-905-99	TRANSISTOR DTC114TU
Q812	8-729-905-35	TRANSISTOR 2SC4081R

RESISTOR

R802	1-216-809-11	METAL GLAZE	100	5%	1/16W
R803	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R804	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R805	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R806	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R807	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R808	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R809	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R810	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R811	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R812	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R813	1-216-849-11	METAL GLAZE	220K	5%	1/16W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R814	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R815	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R816	1-216-819-11	METAL GLAZE	680	5%	1/16W
R817	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R818	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R819	1-216-812-11	METAL GLAZE	180	5%	1/16W
R820	1-216-846-11	METAL GLAZE	120K	5%	1/16W
R821	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R822	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R823	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R824	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R825	1-216-820-11	METAL GLAZE	820	5%	1/16W
R826	1-216-811-11	METAL GLAZE	150	5%	1/16W
R827	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R828	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R829	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R830	1-216-810-11	METAL GLAZE	120	5%	1/16W
R831	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R832	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R833	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R834	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R835	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R836	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R837	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R838	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R839	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R840	1-216-864-11	METAL GLAZE	0	5%	1/16W
R842	1-216-864-11	METAL GLAZE	0	5%	1/16W
R844	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R845	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R846	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R847	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R849	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R850	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R851	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R852	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R853	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R854	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R855	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R856	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R857	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R858	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R859	1-216-816-11	METAL GLAZE	390	5%	1/16W
R860	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R861	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W
R862	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R863	1-216-850-11	METAL GLAZE	270K	5%	1/16W
R864	1-216-852-11	METAL GLAZE	390K	5%	1/16W
R865	1-216-134-00	METAL GLAZE	2.2	5%	1/8W
R866	1-216-144-00	METAL GLAZE	5.6	5%	1/8W

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*A-7061-395-A DM-21P BOARD, COMPLETE

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(Ref. No. 4000 Series)

CAPACITOR

Ref.No	Part No.	Description			Remark
C001	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C002	1-135-155-21	TANTAL. CHIP	4.7MF	20%	16V
C003	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C004	1-124-778-00	ELECT	22MF	20%	6.3V
C005	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C006	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C007	1-162-974-11	CERAMIC CHIP	0.01MF		50V
C008	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C009	1-124-779-00	ELECT	10MF	20%	16V
C010	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C011	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C012	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C013	1-162-637-11	CERAMIC CHIP	0.47MF		16V
C014	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C015	1-162-638-11	CERAMIC CHIP	1MF		16V
C016	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C017	1-126-205-11	ELECT	47MF	20%	6.3V
C018	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C019	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C020	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C021	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C022	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C023	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V

CONNECTOR

CN001	1-565-528-21	PIN, CONNECTOR (PC BOARD) 3P
CN002	* 1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P
CN003	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P
CN004	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P

DIODE

D001	8-719-404-52	DIODE MA143
D003	8-719-404-47	DIODE MA110
D004	8-719-404-47	DIODE MA110
D005	8-719-404-47	DIODE MA110
D006	8-719-404-47	DIODE MA110
D007	8-719-404-47	DIODE MA110

IC

IC001	8-759-100-95	IC UPC324G2
IC002	8-759-701-24	IC NJM3414M
IC003	8-759-103-25	IC UPD4053BG
IC004	8-759-030-36	IC MPC1725MR

COIL

L001	1-410-381-11	INDUCTOR CHIP 10UH

TRANSISTOR

Q001	8-729-805-25	TRANSISTOR 2SB1121
Q002	8-729-905-35	TRANSISTOR 2SC4081R
Q003	8-729-805-25	TRANSISTOR 2SB1121
Q004	8-729-905-35	TRANSISTOR 2SC4081R
Q005	8-729-403-35	TRANSISTOR UN5113
Q006	8-729-402-78	TRANSISTOR XN6401
Q007	8-729-402-13	TRANSISTOR XN1501
Q008	8-729-402-84	TRANSISTOR XN4601
Q009	8-729-905-23	TRANSISTOR 2SA1576R
Q010	8-729-402-84	TRANSISTOR XN4601
Q011	8-729-901-03	TRANSISTOR DTC144WK
Q012	8-729-905-23	TRANSISTOR 2SA1576R
Q013	8-729-905-23	TRANSISTOR 2SA1576R
Q014	8-729-402-42	TRANSISTOR UN5213
Q015	8-729-905-35	TRANSISTOR 2SC4081R
Q016	8-729-905-23	TRANSISTOR 2SA1576R
Q017	8-729-402-84	TRANSISTOR XN4601

RESISTOR

R002	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R003	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R004	1-216-134-00	METAL GLAZE	2.2	5%	1/8W
R005	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R006	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R007	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R008	1-216-840-11	METAL GLAZE	39K	5%	1/16W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R009	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R010	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R011	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R012	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R013	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R014	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R015	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R016	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R017	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R018	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R019	1-216-134-00	METAL GLAZE	2.2	5%	1/8W
R020	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R021	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R022	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R023	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R024	1-216-144-00	METAL GLAZE	5.6	5%	1/8W
R025	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R026	1-216-847-11	METAL GLAZE	150K	5%	1/16W
R027	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R028	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R029	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R030	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R031	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R033	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R034	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R035	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R036	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R037	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R038	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R041	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R042	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R043	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R044	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R045	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R046	1-216-817-11	METAL GLAZE	470	5%	1/16W
R047	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R048	1-216-798-11	METAL GLAZE	12	5%	1/16W
R049	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R050	1-216-817-11	METAL GLAZE	470	5%	1/16W
R051	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R052	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R053	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R054	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R055	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R056	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R057	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R058	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R059	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R060	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R061	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R062	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R063	1-216-833-11	METAL GLAZE	10K	5%	1/16W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV001	1-230-875-21	RES, ADJ, METAL GLAZE 220K

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*A-7061-396-A CD-8P BOARD, COMPLETE
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(Ref.No.4000 Series)

1-627-612-12 FP-92 FLEXBLE BOARD

CAPACITOR

Ref.No	Part No.	Description			Remark
C601	1-135-148-21	TANTAL. CHIP	1.5MF	20%	16V
C602	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C603	1-135-162-21	TANTAL. CHIP	33MF	20%	6.3V
C604	1-135-159-21	ELECT	10MF	20%	20V
C605	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C606	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C607	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C608	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C609	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C610	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V

IC

Ref.No	Part No.	Description
※IC601	8-750-010-89	CCD IMAGER (IU024AK-10A)

TRANSISTOR

Ref.No	Part No.	Description
Q601	8-729-105-53	TRANSISTOR 2SK300

RESISTOR

Ref.No	Part No.	Description			Remark
R602	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R603	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R604	1-216-816-11	METAL GLAZE	390	5%	1/16W
R605	1-216-809-11	METAL GLAZE	100	5%	1/16W
R606	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W

TESTPOINT

Ref.No	Part No.	Description
TP601	*1-535-622-11	PIN, TERMINAL
TP602	*1-535-622-11	PIN, TERMINAL

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*A-7061-397-A LB-12P BOARD, COMPLETE
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(Ref. No. 5000 Series)

1-627-614-11 FP-99 FLEXIBLE BOARD

CAPACITOR

Ref.No	Part No.	Description			Remark
C588	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C589	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C592	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V

CONNECTOR

Ref.No	Part No.	Description
CN592	*1-566-185-11	PIN, CONNECTOR (PC BOARD) 6P

DIODE

Ref.No	Part No.	Description
D591	8-719-106-71	DIODE RD12M-B2
D592	8-719-106-71	DIODE RD12M-B2
D593	8-719-100-05	DIODE 1S2837
D598	8-719-420-14	DIODE MA8082-M
D600	8-719-106-71	DIODE RD12M-B2
D601	8-719-106-71	DIODE RD12M-B2

JACK

Ref.No	Part No.	Description
J591	1-507-921-00	JACK (EARPHONE)
J592	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)
J594	1-550-104-32	HOLDER, BATTERY (LITHIUM)

COIL

Ref.No	Part No.	Description
L586	1-410-192-51	INDUCTOR CHIP 1UH
L587	1-410-192-51	INDUCTOR CHIP 1UH
L588	1-410-192-51	INDUCTOR CHIP 1UH
L591	1-410-369-11	INDUCTOR CHIP 1UH
L592	1-410-369-11	INDUCTOR CHIP 1UH

SWITCH

Ref.No	Part No.	Description
S591	1-570-870-11	SWITCH, SLIDE (EDIT)
S592	1-570-870-11	SWITCH, SLIDE (SP/LP)

When indicating parts by reference number, please include the board name.

※ For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 101.

Ref.No	Part No.	Description			Remark
	*1-627-605-21	FK-7P BOARD *********			
					(Ref. No. 8000 Series)
	1-627-619-11	FP-110 FLEXIBLE BOARD			

DIODE

Ref.No	Part No.	Description
D581	8-719-404-40	DIODE MA121
D582	8-719-404-40	DIODE MA121
D583	8-719-951-38	DIODE CL-50R-CD
D584	1-807-807-11	DIODE CL-50Y-CD

TRANSISTOR

Ref.No	Part No.	Description
Q581	8-729-403-24	TRANSISTOR XN4210

RESISTOR

Ref.No	Part No.	Description			Remark
R581	1-216-190-00	METAL GLAZE	470	5%	1/8W
R582	1-216-190-00	METAL GLAZE	470	5%	1/8W

SWITCH

Ref.No	Part No.	Description
S581	1-571-101-11	SWITCH, SLIDE (POWER)
S582	1-571-684-11	SWITCH, TACTIL (DATA SCREEN)
S583	1-571-684-11	SWITCH, TACTIL (REW)
S584	1-571-684-11	SWITCH, TACTIL (PB)
S585	1-571-684-11	SWITCH, TACTIL (FF)
S586	1-571-684-11	SWITCH, TACTIL (STOP)
S588	1-571-684-11	SWITCH, TACTIL (PAUSE)

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Ref.No	Part No.	Description	Remark
	*A-7061-400-A	DH-4P BOARD, COMPLETE *****************	
			(Ref. No. 4000 Series)

CAPACITOR

Ref.No	Part No.	Description			Remark
C941	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C942	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C943	1-135-145-11	TANTAL. CHIP	0.47MF	20%	35V
C944	1-135-145-11	TANTAL. CHIP	0.47MF	20%	35V
C945	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C946	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C947	1-162-913-11	CERAMIC CHIP	8PF	0.5PF	50V
C948	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C949	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C950	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C951	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V
C952	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V

TRIMMER

Ref.No	Part No.	Description
CT941	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

DIODE

Ref.No	Part No.	Description
D941	8-713-300-88	DIODE 1T33C
D942	8-719-100-05	DIODE 1S2837
D943	8-719-100-05	DIODE 1S2837

IC

Ref.No	Part No.	Description
IC941	8-759-944-88	IC CXK58256MF-12LL
IC942	8-759-971-81	IC MB670479U

COIL

Ref.No	Part No.	Description	
L941	1-410-377-11	INDUCTOR CHIP	4.7UH
L942	1-410-369-11	INDUCTOR CHIP	1UH
L943	1-410-384-11	INDUCTOR CHIP	18UH

TRANSISTOR

Ref.No	Part No.	Description
Q941	8-729-905-18	TRANSISTOR DTC144EU

RESISTOR

Ref.No	Part No.	Description			Remark
R941	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R945	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R946	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R949	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R950	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R951	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R952	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R955	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R956	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R958	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R959	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R960	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R961	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R962	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R963	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R964	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R965	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R966	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R967	1-216-817-11	METAL GLAZE	470	5%	1/16W
R968	1-216-817-11	METAL GLAZE	470	5%	1/16W
R969	1-216-833-11	METAL GLAZE	10K	5%	1/16W

SWITCH

Ref.No	Part No.	Description
S941	1-571-188-21	SWITCH, TACTIL (REFLOW TYPE) (COLOR/MODE)
S942	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE) (MEMORY)
S943	1-571-188-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE2)
S944	1-571-188-21	SWITCH, TACTIL (REFLOW TYPE) (TITLE1)

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Ref.No	Part No.	Description	Remark
	*A-7061-401-A	FC-13P BOARD, COMPLETE ******************	
			(Ref. No. 5000 Series)
	1-627-615-11	FP-101 FLEXIBLE BOARD	
	1-627-616-11	FP-102 FLEXIBLE BOARD	
	1-627-617-11	FP-103 FLEXIBLE BOARD	
	3-728-224-01	HOLDER, LCD	

CAPACITOR

Ref.No	Part No.	Description			Remark
C881	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C882	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C883	1-135-099-21	TANTAL. CHIP	2.2MF		6.3V
C884	1-135-099-21	TANTAL. CHIP	2.2MF		6.3V
C885	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C886	1-164-156-11	CERAMIC CHIP	0.1MF		25V
C887	1-162-638-11	CERAMIC CHIP	1MF		16V
C888	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C889	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C890	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V

TRIMMER

Ref.No	Part No.	Description
CT881	1-141-331-11	CAP, VAR, TRIMMER (CHIP)

DIODE

Ref.No	Part No.	Description
D881	8-719-404-40	DIODE MA121
D882	8-719-404-40	DIODE MA121
D883	8-719-404-40	DIODE MA121
D884	8-719-404-40	DIODE MA121
D885	8-719-404-49	DIODE MA111
D886	8-719-938-72	DIODE SB01-05CP
D887	8-719-812-41	DIODE TLR124

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
D888	8-719-420-15	DIODE MA8082			

IC

Ref.No	Part No.	Description
IC881	8-759-143-52	IC UPD7503GF-J13-3B8

COIL

Ref.No	Part No.	Description
L881	1-410-393-11	INDUCTOR CHIP 100UH

INDICATOR TUBE

Ref.No	Part No.	Description
ND881	1-808-461-11	DISPLAY PANEL, LIQUID CRYSTAL

TRANSISTOR

Ref.No	Part No.	Description
Q881	8-729-403-24	TRANSISTOR XN4210
Q882	8-729-905-12	TRANSISTOR DTA144EU
Q883	8-729-905-23	TRANSISTOR 2SA1576R
Q884	8-729-905-18	TRANSISTOR DTC144EU
Q885	8-729-905-23	TRANSISTOR 2SA1576R
Q886	8-729-402-78	TRANSISTOR XN6401
Q887	8-729-402-19	TRANSISTOR XN6501
Q888	8-729-402-78	TRANSISTOR XN6401
Q889	8-729-109-42	TRANSISTOR 2SK94-X2
Q890	8-729-905-23	TRANSISTOR 2SA1576R
Q891	8-729-905-15	TRANSISTOR DTC144WU
Q893	8-729-905-99	TRANSISTOR DTC114TU

RESISTOR

Ref.No	Part No.	Description			
R881	1-216-864-11	METAL GLAZE	0	5%	1/16W
R883	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R884	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R885	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R886	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R887	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R888	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R889	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R890	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R891	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R892	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R893	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R894	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R895	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R896	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R897	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R898	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R899	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R900	1-218-167-11	METAL GLAZE	330K	1%	1/10W
R901	1-218-167-11	METAL GLAZE	330K	1%	1/10W
R902	1-216-336-11	METAL GLAZE	47K	1%	1/10W
R903	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R904	1-216-848-11	METAL GLAZE	180K	5%	1/16W
R905	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R906	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R907	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R908	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R909	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R910	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R911	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R912	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R913	1-216-809-11	METAL GLAZE	100	5%	1/16W
R914	1-216-861-11	METAL GLAZE	2.2M	5%	1/16W
R915	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R916	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R917	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R918	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R919	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R920	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R921	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R922	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R923	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R924	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R925	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R926	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R927	1-216-045-00	METAL GLAZE	680	5%	1/10W
R928	1-216-295-00	METAL GLAZE	0	5%	1/10W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV881	1-230-874-11	RES, ADJ, METAL GLAZE 100K
RV882	1-237-776-21	RES, VAR, CARBON 10K

SWITCH

Ref.No	Part No.	Description
S881	1-571-188-21	SWITCH, TACTIL (REFLOW TYPE)(SET + /DATE)
S882	1-571-188-21	SWITCH, TACTIL (REFLOW TYPE)(SET NEXT/TIME)
S883	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(RESET)
S884	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(ZERO MEM)
S885	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(EDIT SEARCH +)
S886	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE) (EDIT SEARCH −/▭)
S887	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(WHT BAL)
S888	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(FOCUS)
S889	1-571-187-11	SWITCH, TACTIL (REFLOW TYPE)(SHUTTER SPEED)
S890	1-570-870-11	SWITCH, SLIDE(AUTO LOCK)

CRYSTAL

Ref.No	Part No.	Description
X881	1-527-997-21	VIBRATOR, CRYSTAL (32.768KHz)

* *

*A-7061-403-A VF-12P BOARD, COMPLETE

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(Ref. No. 6000 Series)

Ref.No	Part No.	Description
	3-727-911-01	HOLDER, CRT NECK
	*3-727-912-01	HOLDER, LED

CAPACITOR

Ref.No	Part No.	Description			
C951	1-124-442-00	ELECT	330MF	20%	6.3V
C953	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C954	1-126-160-11	ELECT	1MF	20%	50V
C955	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C956	1-131-381-00	TANTALUM	47MF	10%	6.3V
C957	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C958	1-136-165-00	FILM	0.1MF	5%	50V
C959	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C960	1-124-587-11	ELECT	220MF	20%	6.3V
C961	⚠1-163-047-91	CERAMIC CHIP	0.001MF	10%	50V
C962	⚠1-162-625-91	CERAMIC CHIP	0.0047MF	5%	50V
C963	⚠1-162-625-91	CERAMIC CHIP	0.0047MF	5%	50V
C964	⚠1-163-209-91	CERAMIC CHIP	0.0015MF	5%	50V
C965	1-126-090-11	ELECT	82MF	20%	10V
C966	1-124-257-00	ELECT	2.2MF	20%	35V
C968	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C969	1-102-038-00	CERAMIC	0.001MF		500V

CONNECTOR

Ref.No	Part No.	Description
CN951	*1-566-197-11	PIN, CONNECTOR (PC BOARD) 4P
CN952	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN953	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P

DIODE

Ref.No	Part No.	Description
D951	8-719-404-19	DIODE LN1251C
D953	8-719-400-20	DIODE MA152WA

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description				Remark
		IC				
IC951	8-759-420-01	IC AN2512S				
		COIL				
L951	1-410-831-21	INDUCTOR	82UH			
L952	1-408-783-00	INDUCTOR CHIP	33UH			
L953	⚠1-459-858-21	COIL, FERRITE (HLC)				
		TRANSISTOR				
Q953	8-729-216-32	TRANSISTOR 2SA1163G				
Q954	8-729-100-67	TRANSISTOR 2SC1623				
Q955	8-729-106-07	TRANSISTOR 2SD1615				
		RESISTOR				
R953	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R955	1-216-005-00	METAL GLAZE	15	5%	1/10W	
R956	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R957	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R958	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R959	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R960	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R961	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R962	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R963	1-216-107-00	METAL GLAZE	270K	5%	1/10W	
R964	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R965	1-216-306-11	METAL GLAZE	3.9	5%	1/10W	
R967	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R968	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R969	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R970	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R971	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R972	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R973	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R974	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W	
R975	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W	
R976	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R977	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R978	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R979	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R980	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R981	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R982	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R983	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R984	1-216-021-00	METAL GLAZE	68	5%	1/10W	
		VARIABLE RESISTOR				
RV951	1-237-663-11	RES, ADJ, METAL GRAZE 47K				
RV952	1-237-657-11	RES, ADJ, METAL GRAZE 470				
RV954	1-228-762-00	RES, ADJ, METAL GLAZE 1M				
		TRANSFORMER				
T951	⚠1-439-431-11	TRANSFORMER ASSY, FLYBACK				
		THERMISTOR				
TH951	1-807-938-11	THERMISTOR				
		SOCKET				
W951	⚠1-540-019-11	SOCKET ASSY, CRT				

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Ref.No	Part No.	Description				Remark
	*1-627-607-21	CR-16P BOARD **********				
						(Ref. No. 7000 Series)
		TRANSISTOR				
Q598	8-729-100-76	TRANSISTOR 2SA812				
		RESISTOR				
R598	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
		SWITCH				
S598	1-553-977-00	SWITCH, SLIDE (STANDBY/LOOK)				
S599	1-570-689-11	SWITCH, KEY BOARD (START/STOP)				

****

Ref.No	Part No.	Description				Remark
	*A-7061-405-A	MC-23P BOARD, COMPLETE *****************				
						(Ref. No. 4000 Series)
		CAPACITOR				
C251	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	
C252	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	
C253	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V	
C254	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V	
C255	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C256	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C257	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C258	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C259	1-124-967-11	ELECT	10MF	20%	10V	
C260	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C261	1-126-094-11	ELECT	4.7MF	20%	16V	
C262	1-126-094-11	ELECT	4.7MF	20%	16V	
C263	1-126-154-11	ELECT	47MF	20%	6.3V	
C264	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	
C265	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	
C266	1-126-154-11	ELECT	47MF	20%	6.3V	
C267	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V	
C268	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C269	1-163-024-00	CERAMIC CHIP	0.018MF	10%	50V	
		CONNECTOR				
CN251	*1-566-182-11	PIN, CONNECTOR (PC BOARD) 3P				
		DIODE				
D251	8-719-404-46	DIODE MA110				
		JACK				
J251	1-507-921-00	JACK (MIC PLUG IN POWER)				
J252	1-563-454-11	JACK, MINIATURE (DC OUT)				
		TRANSISTOR				
Q251	8-729-100-76	TRANSISTOR 2SA812				
Q252	8-729-905-35	TRANSISTOR 2SC4081R				
Q253	8-729-905-35	TRANSISTOR 2SC4081R				
Q254	8-729-905-35	TRANSISTOR 2SC4081R				
Q255	8-729-100-76	TRANSISTOR 2SA812				
Q256	8-729-905-35	TRANSISTOR 2SC4081R				
Q257	8-729-905-35	TRANSISTOR 2SC4081R				
		RESISTOR				
R251	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R252	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R253	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R254	1-216-083-00	METAL GLAZE	27K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark
R256	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R257	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R258	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R259	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R260	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R261	1-216-834-11	METAL GLAZE 12K 5% 1/16W	
R262	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R263	1-216-836-11	METAL GLAZE 18K 5% 1/16W	
R264	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R265	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R266	1-216-792-11	METAL GLAZE 3.9 5% 1/16W	
R267	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R268	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R269	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R270	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	

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MISCELLANEOUS

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Ref.No	Part No.	Description	Remark
	1-466-005-11	CONVERTER UNIT, DC-DC	
	1-542-101-11	MICROPHONE (C-2020)	
	1-547-297-11	LENS, ZOOM (VCL-1206YJ)	
	1-574-088-11	FIBER, OPTICAL	
	1-574-125-11	CABLE, FLAT (1.0MM PITCH 39P)	
	1-627-612-11	FP-92 FLEXIBLE BOARD	
	1-627-722-11	FP-149 FLEXIBLE BOARD	
*IC601	8-750-010-89	CCD IMAGER IU024AK-10A	
J001	1-537-142-11	TERMINAL BOARD (VIDEO/AUDIO/RFU DC OUT)	
M901	A-7048-214-A	DRUM ASSY (DGH-37A-R)	
M902	8-835-329-01	MOTOR, DC U-21A (CAPSTAN)	
M903	1-541-607-11	MOTOR, DC (LA12G-344VA)(LOADING)	
M904	3-707-497-01	METER ASSY, EE (IRIS, METER)	
M905	1-541-602-11	MOTOR, DC (GM-1676)(ZOOM)	
M906	1-541-603-11	MOTOR, DC (GM-1675)(AF)	
S901	1-571-667-11	SWITCH, PUSH ZOOM	
V901	⚠.1-452-482-21	CRT ASSY (M01JYZ60WB)	

ACCESSORIES AND PACKING MATERIALS

****

Ref.No	Part No.	Description	Remark
	*3-340-514-01	BAG, PROTECTION	
	*3-725-348-01	CUSHION (UPPER)	
	*3-725-349-01	CUSHION (LOWER)	
	*3-764-631-12	INSTRUCTION, DEW CONDENSATION	
	3-786-097-41	MANUAL, INSTRUCTION (ENGLISH)	
	3-786-097-51	MANUAL, INSTRUCTION (FRENCH,GERMAN,SPANISH)(AEP, E MODEL)	
	3-786-097-61	MANUAL, INSTRUCTION (DUTCH,SWEDISH,ITALIAN)(AEP MODEL)	
	3-786-097-81	MANUAL, INSTRUCTION (ARABIC)(E MODEL)	
	3-786-097-91	MANUAL, INSTRUCTION (PORTUGUESE)(AEP MODEL)	

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ACCESSORIES AND PACKING MATERIALS (KIT)

****

Ref.No	Part No.	Description	Remark
	A-6767-706-A	RFU ADAPTOR RFU-89 (AEP, E MODEL)	
	A-6767-707-A	RFU ADAPTOR RFU-89 (UK MODEL)	
	A-6767-772-A	RFU ADAPTOR RFU-89 (AUS MODEL)	
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)	
	3-712-595-21	BELT, SHOULDER	
	3-712-673-01	SCREWDRIVER	
	*3-725-169-31	SLEEVE, ACC KIT	
	*3-725-170-01	CUSHION (UPPER), ACC	
	*3-725-171-01	CUSHION (LOWER), ACC	
	*3-727-156-11	INDIVIDUAL CARTON	
	**	AC ADAPTOR (AC-V30)	
	***	BATTERY PACK (NP-55)	

Note:
**Mark parts is available for repair service.
***Mark parts is available asaoptional accessories.

HARDWARE LIST

Ref.No	Part No.	Description	Remarks
		SCREW	
	7-621-255-75	SCREW +P 2X12 TYPE2 NON-SLIT	
	7-621-772-18	SCREW +B 2X4	
	7-621-772-50	SCREW +B 2X10	
	7-621-772-78	SCREW +B 2X14	
	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
		STOP RING	
	7-624-102-04	STOP RING 1.5, TYPE-E	
		STEEL, BALL	
	7-671-154-01	STEEL, BALL	

* For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 101.

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

9-972-725-11

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Personal Video Group

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CCD-F450E
RMT-502

SONY®
SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

SUPPLEMENT-1

ADJUSTMENT

File this supplement-1 with the service manual.

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The color reproduction standard frame is contained after the adjustment elements location of camera adjustment parts.

SECTION 1
SERVICE MODE

☆This unit adopts the camera adjustment and the EVR (Electronic Variable resistor) with the SENSER LANC system.

1-1. SENSER LANC

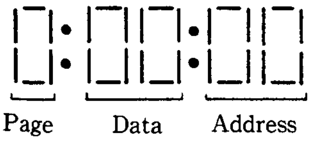
SENSER LANC is the LANC format to adjust the EVR (Electronic Variable resistor) of Video 8 Handycam and to perform tests by using the LANC (control L). This word stands for the same as the SERVICE LANC formerly used, however, the unified word "SENSER LANC" will be used with this substantial functions.

1-1-1. How to Use RM-95 jig (remote control for adjustment)

RM-95 jig is used to operate the SENSER LANC. HOLD switch of this jig is remodelled for service to get the SENSER LANC mode. Replacing microcomputer in RM-95 is required for the old-model RM-95 jig, which has no page display function.

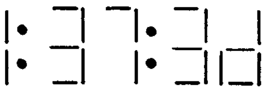
Old model	μPD7503G-A71-12 μPD7503G-C23-12	8-759-142-56 8-759-146-77	Page is not displayed (Replacing microcomputer is required)
New model	μPD7503G-C56-12	8-759-148-35	Page is displayed

LCD display of RM-95



⇨

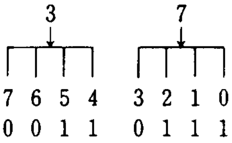
Example



This means that the page 1 and address 3D is data of 37.

- Reference between Data and Bit

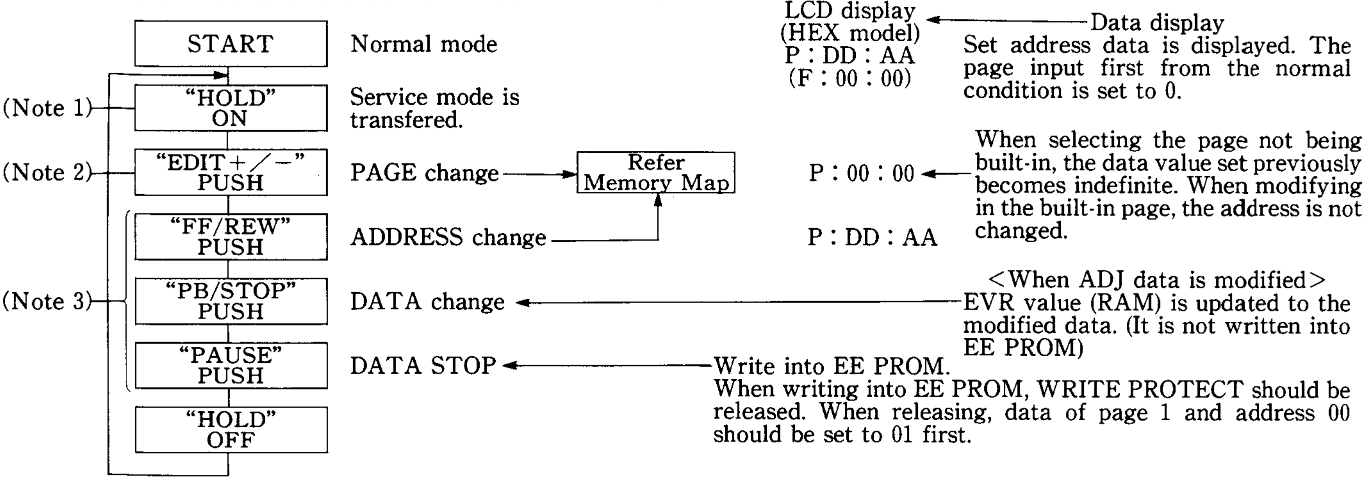
When the data is 37 ⇨ Bit



Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE
		0	0	1	1	0	1	1	1

The data in the above list means as follows:
ME SW ....ON
REC PROOF SW ....ON
AUDIO MUTE ......ON
JOG..................ON
VA PB MODE........ON

1-1-2. Tansfer method of the service mode with RM-95


START
Normal mode
(Note 1)
"HOLD" ON
Service mode is transfered.
(Note 2)
"EDIT+/−" PUSH
PAGE change
Refer Memory Map
"FF/REW" PUSH
ADDRESS change
(Note 3)
"PB/STOP" PUSH
DATA change
"PAUSE" PUSH
DATA STOP
"HOLD" OFF
LCD display (HEX model)
P : DD : AA
(F : 00 : 00)
P : 00 : 00
P : DD : AA

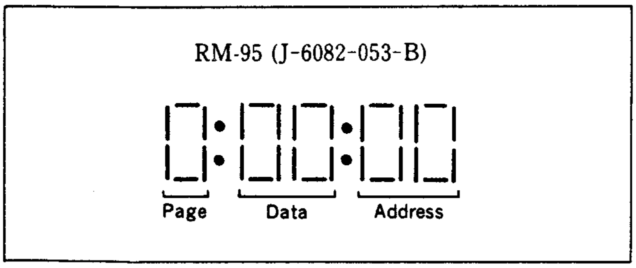
Data display
Set address data is displayed. The page input first from the normal condition is set to 0.

When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

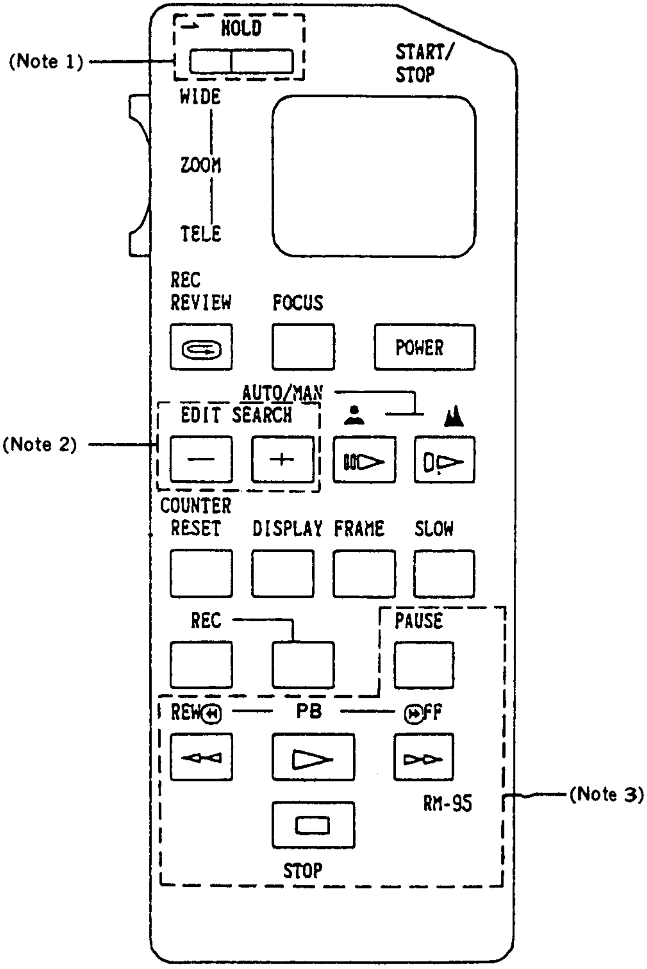
<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

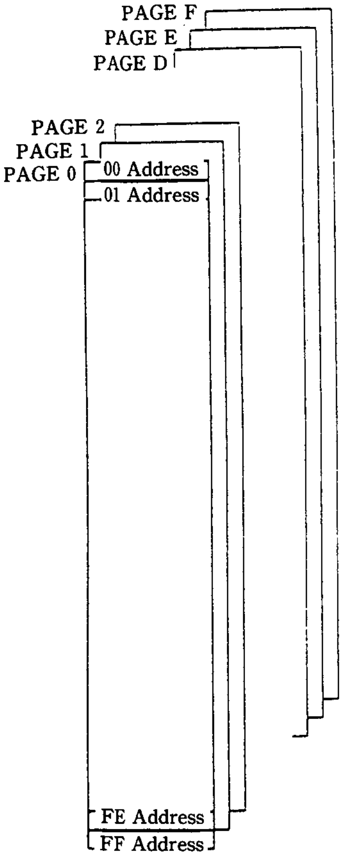
Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM: RAM	Pause


RM-95 (J-6082-053-B)
0:00:00
Page
Data
Address

RM-95 (J-6082-053-B)


(Note 1)
HOLD
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
(Note 2)
−
+
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PB
FF
RM-95
(Note 3)
STOP

1-1-3. SENSER LANC Memory Map



PAGE	Page allocation	Description
0	Service	
1	Mode Control RAM	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2	Mode Control I/O	
3	Mechanical Control RAM	RAM and I/O memory area of the mechanical controller.
4	Mode Control I/O	
5	Camera microcompuler RAM	RAM and I/O memory area of the camera micro controller.
6	Camera microcompuler I/O	
7	Spare	
8	Spare	
9	Spare	
A	Spare	
B	Spare	
C	Spare	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is tuned off. Releasing protect is required for changing data.
E	Camera EE-PROM2	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is tuned off.
F	Camera EE-PROM1	

Note) There are 16 types of page from 0~F. The allocation of page is as the above list. Only the memory of page D, E and F is not erased when the power is turned off as the EVR (Electronic Variable resistor).

1-1-4. Types of Self-diagnostic Feature

This unit has ADJUST mode and TEST mode as follows:

MODE		Contents
ADJUST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
TEST	Pass adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergency is not detected except for TOP/END detection of the TAPE.
	Read of emergency code	The following functions are added to the emergency display function currently in use. ①The lithium battery is not required because to memorize into EE-PROM is allowed. ②The first emergency and the last emergency are memorized. ③The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

1-1-5. How to use practically

How to use:

How to set the adjustment mode and the TEST mode

Set RM-95 to the service mode. (HOLD SW "ON")

How to change and write data

Press the PAUSE button of RM-95. Pressing PAUSE button is not required for some RAM and I/O area.

Change and write data of EE-PROM

Removing PROTECT is required. The PROTECT is removed by setting as follows:

PAGE 1	Address 00	Data 01

But CAMERA system don't need release, because don't set PROTECT.

How to release each mode

Releasing from EE-PROM area	Be sure to return the data of PAGE 1 address 00 to 00 from 01, and then turn off the service mode of RM-95.
Releasing from RAM and I/O area	Turn off the service mode or turn off the power, because hoding of data is not required.

- In order to perform the pass track shift......Refer to page 9.
- In order to inhibit the emergency detection......Refer to the list in page 55.
- In order to check the emergency code......Refer to page 56.
- In order to operate the motor singly......Refer to page 59.
- In order to check the function switch......Refer to page 58.
- In order to check the mechanical switch......Refer to page 57.
- In order to read the A/D selecting value......Refer to page 59.
- In order to check the reception contents of the wireless remote control......Refer to page 59.

SECTION 2
MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

Refer to mechanical adjustment (8 mm Video MECHANICAL ADJUSTMENT MANUAL III) manual for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-972-732-11)

For setting of the track shift mode, however, refer to the following.

2-1. SETTING THE TRACK SHIFT MODE

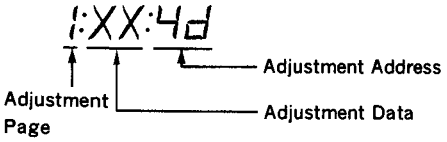
Note : Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Press EDIT SEARCH + button once, and select page 1.
3) Select the adjustment address 4D with FF or REW button.
4) Set to 3X with PLAY and STOP button. (Setting of track shift mode)

Note : 3X should be the number from 31 to 3F. (To display "3X" with PLAY and STOP button is simple to shift.)
(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)

5) Set to the HOLD OFF side in order to set the normal mode.



(1X : TEST 1
2X : TEST 2 ('CH Playback)
3X : TEST 3 (Shift mode)
4X : Shift release)

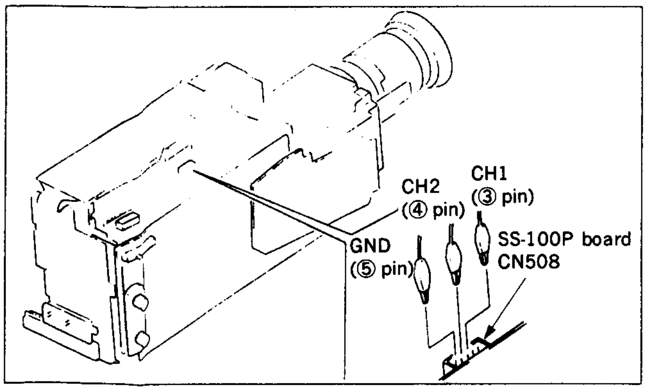


Fig. 2-1.

2-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1 : SS-100P board CN508 pin ③ (PB RF)
   CH2 : SS-100P board CN508 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1CP) (8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. When not flat, make adjustment as follows. (Refer to Figs. 2-1 and 2-2.)

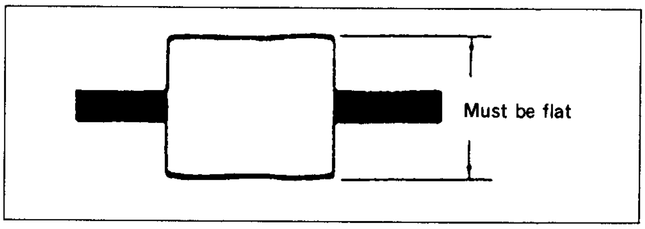


Fig. 2-2.

SECTION 3
CAMERA ADJUSTMENTS

See the adjusting part location diagram from on page 50 for the adjustment.

PREPARATION FOR ADJUSTMENT (CAMERA BLOCK)

3-1. LIST OF SERVICING JIGS

- Oscilloscope
- Stabilized power supply (2 units)
- Adjusting screwdriver
- L lench
- Stop watch
- Color monitor TV
- Vectorscope
- Desk-top calculator

Ref. No.	Name	Part No.	Use
J-1	Filter (C14)	J-6080-054-A	Auto white balance adjustment
J-2	ND filter 0.4	J-6080-806-A	Max gain adjustment, shutter IN/OUT adjustment (2 psc. use)
	ND filter 0.1	J-6080-807-A	Max gain adjustment, shutter IN/OUT adjustment, Auto focus check
	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 pcs. use) Auto focus check
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Extension cable (5P)	J-6082-043-A	To connect VC-67P board CN304 and DC-DC converter
	Extension cable (4P)	J-6082-042-A	To connect VC-67P board CN307 and VA-46P board W701
J-6	Extension cable (20P)	J-6082-063-B	To connect VA-46P board CN703 and CT-21P board CN705
J-7	Extension cable (12P)	J-6082-056-A	To connect VC-67P board CN305 and VA-46P board W702
J-8	Camera fixing jig	J-6080-894-A	
J-9	Siemens-star	J-6080-875-A	Flange back adjustment
J-10	Adjustment remote control *1	J-6082-053-B	
J-11	AF microcomputer data reader jig *2	J-6082-025-A	

*1 Microcomputer IC in the adjustment Remote controller except for UPD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

*2 Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the number is kept to 10K, the adjustment data can not change because of the difference of of the impedance.)
When adjustment the old-model Handy Cam, 100kΩ is allowed to perform the adustment.

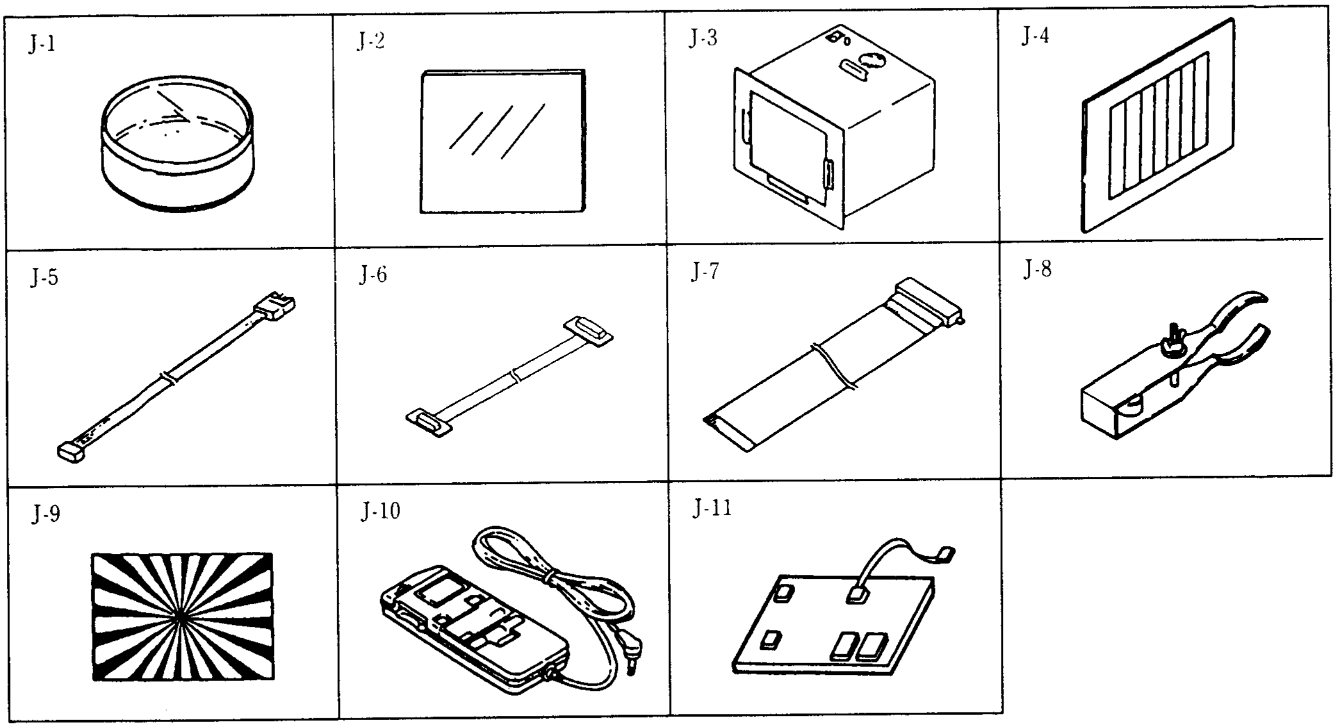

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

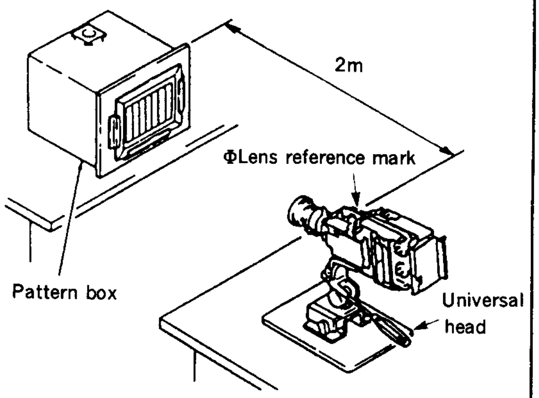
Fig. 3-1.

3-2. PREPARATION FOR ADJUSTMENT

3-2-1. Preparation

Note : Refer to the service manual, "SECTION 2. DISASSEMBLY" for details of the cabinet and individual boards removal procedure.

1) Connect the camera block and the video block by using the extension cable, and other equipment as shown in Fig. 3-3.
2) EVF (Electrical View Finder) section VF-26P or VF-27P boards is necessary for confirmation of shutter speed, white balance mode and etc.
   If not necessary, it can removed by taking out CN931 on the SW-124P board.
3) MIC board (MC-44P board) is not necessary. Remove it by taking out W651 on the MC-44P board.


2m
ΦLens reference mark
Pattern box
Universal head

When the camera block and the video block are separated with the cabinet removed, fix by using the camera fixing jig.

Fig. 3-2.

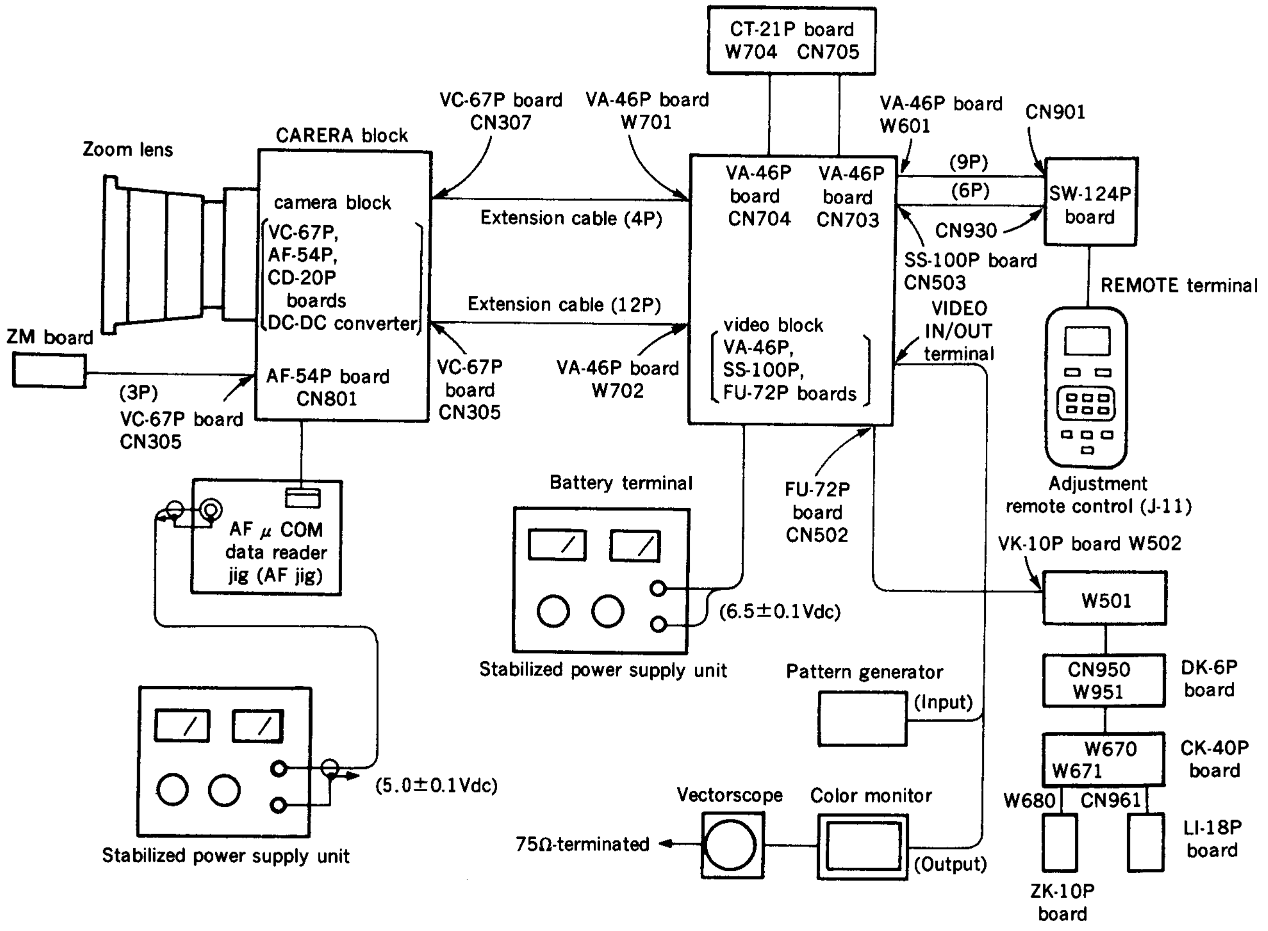

CT-21P board
W704 CN705
VC-67P board CN307
VA-46P board W701
VA-46P board W601
CN901
Zoom lens
CARERA block
camera block
VC-67P,
AF-54P,
CD-20P
boards
DC-DC converter
Extension cable (4P)
VA-46P board CN704
VA-46P board CN703
(9P)
(6P)
SW-124P board
CN930
SS-100P board
CN503
REMOTE terminal
Extension cable (12P)
VIDEO IN/OUT terminal
video block
VA-46P,
SS-100P,
FU-72P boards
ZM board
AF-54P board
CN801
(3P)
VC-67P board
CN305
VC-67P board CN305
VA-46P board W702
Battery terminal
FU-72P board
CN502
Adjustment remote control (J-11)
VK-10P board W502
AF μ COM data reader jig (AF jig)
W501
(6.5±0.1Vdc)
Stabilized power supply unit
Pattern generator
(Input)
CN950
W951
DK-6P board
W670
W671
CK-40P board
(5.0±0.1Vdc)
Vectorscope
Color monitor
W680
CN961
75Ω-terminated
(Output)
LI-18P board
ZK-10P board
Stabilized power supply unit

Fig. 3-3.

3-2-2. Caution

1) Setting of switches
Unless otherwise specified, set the switches to the following position for making adjustments.
   1. AUTO LOCK switch
      ......Lock release position
   2. FOCUS button (S671 on CK-40P board)
      ......MANUAL mode
   3. WHITE BALANCE button (S674 on CK-40P board)
      ......INDOOR mode ("INDOOR" indication appears on EVF.)
   4. SHUTTER SPEED button (S670 on CK-40P board)
      ......NORMAL mode (No indications of "100" "2000", etc. appear on EVF.)
2) Adjustment order
As a rule, adjust in described order.
3) Objects
   1. Color bar chart (standard picture frame)
      When making Adjustments by the use of a color bar chart, adjust the picture frame as shown in Fig. 3-4. (Standard picture frame)

Color Bar Chart Standard Picture Frame

☆ Basically, adjust the color bar chart standard picture frame with the under-scanning monitor as shown in Fig. a.

1) Place a black window with the horizontal width same as that of a color bar pattern, respectively on left and right sides of the screen. (A=B)
2) Put together lower ends of the color pattern and under-scanning monitor in the vertical direction.

Fig. a

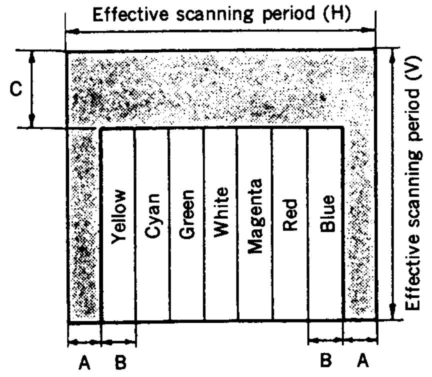
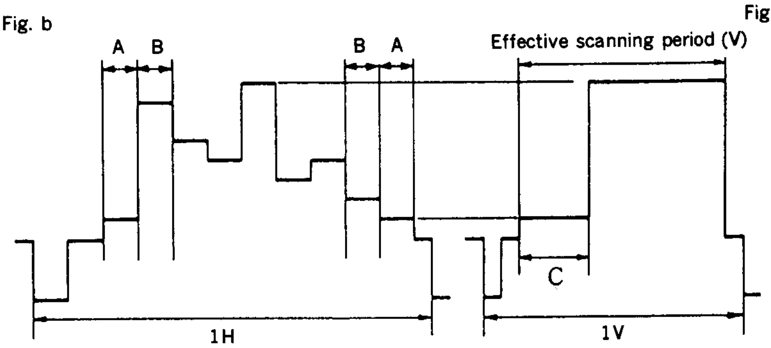

Effective scanning period (H)
C
Yellow
Cyan
Green
White
Magenta
Red
Blue
Effective scanning period (V)
A
B
B
A

Fig. b

Fig. c

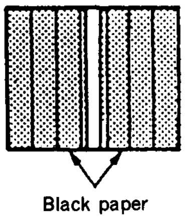

A
B
B
A
Effective scanning period (V)
C
1H
1V

●To photograph the color bar chart standard picture frame shown in Fig. a. adjust Output Y (CN307①) on VC-67P board) as shown in Fig.b and c.

Fig. 3-4.

2. All white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (68mm).
3. High luminance pattern
   Prepare a high luminance pattern as shown in Fig. 3-5 and adjust the picture frame as shown in Fig. 3-6.
4. Siements star (J-6080-875-A)
   orient a camera to have the siemens star center coincide with the monitor screen center on a monitor TV screen.

High luminance pattern


Black paper

Cover a color bar chart with black paper, except half the width of its white stripe. Then shoot the chart in this state.

Fig. 3-5.

High luminance pattern

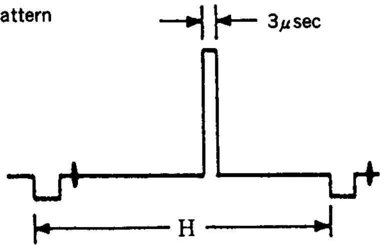


Fig. a (camera output waveform of CPA pin(A8) on VC-67P board)

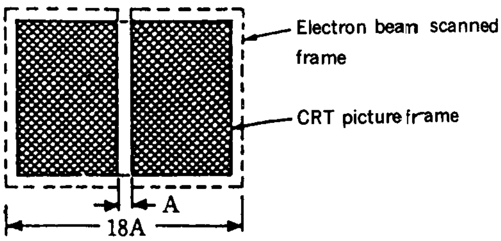

Electron beam scanned frame
CRT picture frame
A
18A

Fig. b (Picture of monitor TV screen)

By operating the camera zooming and orientation have the Fig. a output waveform output and the Fig. b monitor TV image displayed.

Fig. 3-6.

3-2-3. Adjustment Remote Control

In the camera block, the EVR (Electronic Variable Resistor) is used as an adjustment element in place of a conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (VC-67P board IC501). This microcomputer reads the data written in the non-volatile memory inside the microcomputer and sends it to the EVR. The EVR generates an adjustment voltage by D-A conversion of this data (8 bits per one adjustment point).

To adjust, the camera block, therefore, it is necessary to rewrite the adjustment data written in the non-volatile memory. The adjustment remote control is used for this purpose. The adjustment remote control performs bidirectional communications with the microcomputer in the camera block through a remote control signal line (LANC). UP/DOWN commands for adjustment page, address and data are sent from the adjustment remote control to the microcomputer in the camera block. Sent from the microcomputer in the camera block to the adjustment remote control are the adjustment page, address and data.

Note : The microcomputer IC in the adjustment remote controller except for new microcomputer (UPD7503G-C56-12) dose not allow the adjustment page selecting. Replace with the new microcomputer (8-759-148-35) in such a case.

1. Using the Adjustment Remote Control

1) Connect the adjustment remote control to the REMOTE terminal (SW-124P board J901).
(Shift the HOLD switch of the adjustment remote control to the HOLD position (SERVICE position).)
2) Turn on the power for the main unit.
3) If the connection is correct, the following is displayed on the adjustment remote control LCD. (The adjustment data varies from one set to another.)

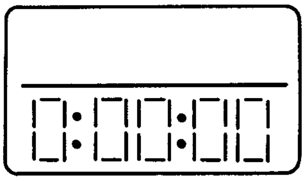


Fig. 3-7. (a)

4) Specify your desired adjustment page by the adjustment remote control.
Pressing the EDIT SEARCH (+) increments the adjustment page. Pressing the EDIT SEARCH (−) decrements it. The adjustment page is shown in the hexadecimal numbers and there are 16 of them from 1 to F. The CAMERA adjustment page is page F and Pressing the EDIT SEARCH (−) buttom one push.

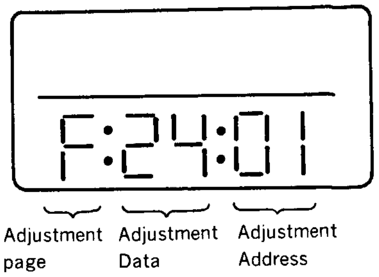


Fig. 3-7. (b)

5) Specify your desired adjustment address by the adjustment remote control. Pressing the FF (▶▶) button increments the adjustment address, and pressing the REW (◀◀) button decrements it.
(The adjustment address is shown in the decimal number and there are 256 of them from 00 to FF. The adjustment address corresponds to the output terminal of the EVR (IC301 on the VC-67P board, IC504 on the VC-67P board, and IC004 of the MX-12P board). Refer to Table 3-3 for adjustment of each address.)
6) Make adjustment by increasing/decreasing the adjustment data.
Pressing the PLAY (▶) button increases the adjustment data, and pressing the STOP (■) button decreases it.

- The adjustment data is shown in the hexadecimal number and assumes 256 kinds of values ranging from 00 to FF.

Hexadecimal No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication of LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal converted value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 3-1.

- The adjustment data corresponds to the output voltage of the EVR (IC301 on the VC-67P board, IC504 on the VC-67P board, and IC004 on the MX-12P board) as follows:
  MX-12P board IC004 : 2.0 ⟷ 5.0 Vdc
  VC-67P board IC301 : 0 ⟷ 5.0Vdc
  VC-67P board IC504 : 1.0 ⟷ 3.5Vdc

7) Change the adjustment address with the FF (▶▶) or REW (◀◀) button in order to store the adjustment data into the non-volatile memory built in the EVR/AWB microcomputer (VC-67P board IC501).
(If this operation is omitted, new adjustment data will not be stored into the non-volatile memory.)
8) There is a function provided to make note of the last error cuased by the COUNTER RESET button during operation of the set even if the power is turned off. This LAST MEMO EMERGENCY (last error) can be cleared.

2. Cautions for Using the Adjustment Remote Control

Erroneous operation of the adjustment remote control may delete correct adjustment data. To avoid this, it is recommended to make note of all the adjustment data before adjustment and of new adjustment data every time adjustment of one item is completed.

3. List of Adjustment Addresses

Use the adjustment page F for the camera part adjustment of this unit.

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
01	MX-12P board IC004 pin ⑱	R CONT	Auto white balance adjustment	
02	MX-12P board IC004 pin ⑲	B CONT		
03	MX-12P board IC004 pin ②	C_1 GAIN	Matrix (3) C_1 gain adjustment	
04	MX-12P board IC004 pin ③	B GAIN	Pre-white balance adjustment	
05	MX-12P board IC004 pin ④	R GAIN		
06	MX-12P board IC004 pin ⑤	Y_2 GAIN	Matrix adjustment (2) Y_2 gain adjustment	
07	MX-12P board IC004 pin ⑥	Y_1 GAIN	Matrix adjustment (1) Y_1 gain adjustment	
08	MX-12P board IC004 pin ⑦	Y_H GAIN	Y_H level adjustment	
09	MX-12P board IC004 pin ⑧	R-Y GAIN	Color reproducibility adjustment	
0A	MX-12P board IC004 pin ⑨	B-Y GAIN		
0B	MX-12P board IC004 pin ⑫	R-Y HUE		
0C	MX-12P board IC004 pin ⑬	B-Y HUE		
0D	VC-67P board IC301 pin ⑱	SHP LEVEL	H aperture Adjustment	
0E	VC-67P board IC301 pin ⑲	Y LEVEL	White clip, Y level adjustments	
0F	VC-67P board IC301 pin ②	VAP GAIN		
10	VC-67P board IC301 pin ③	SET UP	Set up adjustment	
11	VC-67P board IC301 pin ④	C LEVEL	Chroma level adjustment	
12	VC-67P board IC301 pin ⑤	V SUB CONT	V sub adjustment	
13	VC-67P board IC301 pin ⑥	PG CONT	PG cont adjustment	
14	VC-67P board IC301 pin ⑦	Yr CONT		
15	VC-67P board IC301 pin ⑧	WHITE CLIP	White clip adjustment	
16	VC-67P board IC301 pin ⑨	SYNC LEVEL	Sync level adjustment	
17	VC-67P board IC301 pin ⑫	BURST LEVEL	Burst level adjustment	
18	VC-67P board IC301 pin ⑬	MAX GAIN	Set up, Max gain adjustments	
19	VC-67P board IC504 pin ⑱	IRIS REF	Iris adjustment	
1A	VC-67P board IC504 pin ⑲	AGC REF	AGC adjustment	
1B	VC-67P board IC504 pin ②	HALL GAIN	Hall adjustment	
1C	VC-67P board IC504 pin ③	HALL OFFSET		
1D	VC-67P board IC504 pin ④	FADER LEVEL	Fader level adjustment	
1E	VC-67P board IC504 pin ⑤	————		
1F	VC-67P board IC504 pin ⑥	FADER CONT	Fader level adjustment	
20	VC-67P board IC504 pin ⑦	FOCUS SPEED		
21	VC-67P board IC504 pin ⑧	ZOOM SPEED		
22	VC-67P board IC504 pin ⑨	M IRIS CONT	Not used	
23	VC-67P board IC504 pin ⑫	M AGC CONT		
24	VC-67P board IC504 pin ⑬	AGC IN PULSE		

Table 3-2 (1)

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
25		IN OUT		
26		M12-THR		
27		KATAMUKI		
28		FA-WM		
29		FA-BM	Auto Focus adjustment (1) AF Data Input Preparation	
2A		FH-WM		
2B		FH-BM		
2C		FA-SMH		
2D		FA-SML		
2E		FH-SMH		
2F		FH-SML		
30		LOW-F-SPEED	Focus Motor Speed adjustment	
31		MAN-F-SPEED		
32		STEP-A		
33		END-SENS-V		
34		ZOOM-POSI 1		
35		ZOOM-POSI 2		
36		ZOOM-POSI 3		
37		ZOOM-POSI 4	Macro Aria adjustment	
38		ZOOM-POSI 5		
39		FOCUS-POSI 1		
3A		SEARCH-V		
3B		BACK RUSH 2		
3C		BACK RUSH MODE 3		
3D		ZOOM-TAN-MASK		
3E		ZOOM-END-V		
3F		ZOOM-MODOSI		
40		BACK RUSH-ZOOM		
41		NOT WIDE STOP		
42		MODE 12 NG THR		
43		FA-BASE H-IN		
44		FA-BASE-OUT		
45		AGC-W	Auto Focus adjustment (1) AF Data Input Preparation	
46		AGC-B		

Table 3-2 (2).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
47		MODE 12 NG LIMIT H		
48		MODE 12 NG LIMIT L		
49		M2 HANTEN		
4A		MODE 5 THR 1		
4B		YOGIRI-IN		
4C		MODE 5 FH FILT		
4D		MODE 5 THR 2 IN		
4E		MODE 5 THR 3		
4F		FH-NG-COUNT		
50		TYUU WAKU		
51		YOGIRI-OUT		
52		MODE 5 THR 20 OUT		
53		AF IRIS IN OUT		
54		MACRO TIME OUT H		
55		MACRO TIME OUT L		
56		MACRO SEARCH		
57		SEISHI		
58		ZOOM-SPEED 1		
59		ZOOM-SPEED 2		
5A		ZOOM-SPEED 3		
5B		ZOOM-SPEED 4		
5C		————		
5D		————		
5E		————		
5F		————		
60		IRIS REF-NOR		
61		IRIS REF-PO		
62		IRIS REF-SP		
63		IRIS DATA 1		
64		GAIN-REF		
65		GAIN-MAX		
66		EMG-AGC		
67		EMG-AGC-HYS		
68		EMG-AE (H)		
69		EMG-AE (L)		

Table 3-2 (3).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
6A		EMG-AE-HYS (H)		
6B		MAXSHUT-PO (H)		
6C		MAXSHUT-PO (L)		
6D		MAXSHUT-SP (H)		
6E		MAXSHUT-SP (L)		
6F		REF-WIDTH (H)		
70		REF-WIDTH (L)		
71		SHUT-MULTI (H)		
72		SHUT-MULTI (L)		
73		SHUT-COUNT 1		
74		SHUT STEP-MULTI		
75		IRIS OPEN		
76		REF-TURBO (H)		
77		REF-TURBO (L)		
78		TURBO-WIDTH (H)		
79		TURBO-WIDTH (L)		
7A		TURBO-TR (H)		
7B		TURBO-TR (L)		
7C		SHUT-COUNT 2		
7D		SHUT-COUNT 3		
7E		———		
7F		———		
80		USER R-Y GAIN		
81		USER B-Y GAIN		
82		USER B-Y HUE		
83		USER R-Y HUE		
84		USER SHP LEVEL		
85		USER Y LEVEL		
86		———		
87		———		
88		———		
89		———		
8A		———		
8B		———		
8C		———		

Table 3-2 (4).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
8D		———		
8E		———		
8F		———		
90		R3200 MSB		
91		R3200 LSB		
92		R3200 MSB		
93		R3200 LSB		
94		G3200 MSB		
95		G3200 LSB		
96		SHUTTER IN	Shutter IN/OUT adjustment	
97		SHUTTER OUT		
98		START R	Auto white balance adjustment	
99		START B		
9A		R OUT DOOR		
9B		B OUT DOOR		
9C		———		
9D		———		
9E		———		
9F		———		
A0		Ra	Auto white balance adjustment	
A1		Rb		
A2		Rc		
A3		Ba		
A4		Bb		
A5		Bc		
A6		R/B TOP		
A7		R/B MDL		
A8		R/B BTM		
A9		B/R TOP		
AA		B/R MDL		
AB		B/R BTM		
AC		BTM SLP R		
AD		BTM SLP B		
AE		MDL SLP R		
AF		MDL SLP B		

Table 3-2 (5).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
B0		TOP SLP R	Auto white balance adjustment	
B1		TOP SLP B		
B2		KEIKO R		
B3		KEIKO B		
B4		BTM UP		
B5		BTM DWN		
B6		MDL UP		
B7		MDL DWN		
B8		TOP UP	Auto white balance adjustment	
B9		TOP DWN		
BA		KEIKO		
BB		KEIKO DWN		
BC		R TOP LMT		
BD		R DWN LMT	Auto white balance adjustment	
BE		B TOP LMT		
BF		B IN TOP		
C0		B IN MAX		
C1		B OUT MIN		
C2		B OUT DWN		
C3		B DWN LMT		
C4		LL LMT		
C5		TM DIVID		
C6		BM DIVID		
C7		DELAY TM		
C8		FAST TM		
C9		OUT HYS OFF		
CA		OUT B HYS		
CB		————		
CC		————		
CD		————		
CE		————		
CF		————		
D0		SYSTEM	NTSC/PAL select	
D1		————		
D2		————		

Table 3-2 (6).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>D3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DB</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DC</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DD</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DE</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DF</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E0</td><td></td><td>DISPLAY MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment data.</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>DISPLAY MODE R, B, CONT</td></tr>
<tr><td>01</td><td>NEW R, B</td></tr>
<tr><td>02</td><td>R RATIO</td></tr>
<tr><td>03</td><td>B RATIO</td></tr>
<tr><td>04</td><td>R GAIN</td></tr>
<tr><td>05</td><td>B GAIN</td></tr>
<tr><td>06</td><td>RM DATA</td></tr>
<tr><td>07</td><td>GM DATA</td></tr>
<tr><td>08</td><td>BM DATA</td></tr>
<tr><td>09</td><td>NORM R</td></tr>
<tr><td>0A</td><td>NORM B</td></tr>
<tr><td>0B</td><td>R DATA</td></tr>
<tr><td>0C</td><td>G DATA</td></tr>
<tr><td>0D</td><td>B DATA</td></tr>
<tr><td>0E</td><td>R_1, B AIM</td></tr>
<tr><td>0F</td><td>ERROR</td></tr>
</table></td><td>00</td></tr>
<tr><td>E1</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E2</td><td></td><td>—</td><td></td><td></td></tr>
</table>

Table 3-2 (7).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>E3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EB</td><td></td><td>MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>NORMAL</td></tr>
<tr><td>01</td><td>F-HANTING</td></tr>
<tr><td>03</td><td>ZOOM-POSI</td></tr>
<tr><td>05</td><td>IRIS-POSI</td></tr>
<tr><td>0B</td><td>AGC-CONT</td></tr>
<tr><td>0D</td><td>FOCUS-POSI</td></tr>
<tr><td>11</td><td>SHUTTER IN/OUT</td></tr>
<tr><td>13</td><td>AE LEVEL</td></tr>
<tr><td>ED</td><td>FILTER-FHM</td></tr>
<tr><td>EF</td><td>FILTER-FAM</td></tr>
<tr><td>F1</td><td>FILTER-SFH L</td></tr>
<tr><td>F3</td><td>FILTER-SFH H</td></tr>
<tr><td>F5</td><td>FILTER-SFA L</td></tr>
<tr><td>F7</td><td>FILTER-SFA H</td></tr>
<tr><td>F9</td><td>FILTER-FA L</td></tr>
<tr><td>FB</td><td>FILTER-FH L</td></tr>
<tr><td>FD</td><td>FILTER-FA H</td></tr>
<tr><td>FF</td><td>FILTER-FH H</td></tr>
</table></td><td></td></tr>
<tr><td>EC</td><td></td><td>AWB MODE 3</td><td></td><td></td></tr>
<tr><td>ED</td><td></td><td>AWB MODE 2</td><td></td><td></td></tr>
<tr><td>EE</td><td></td><td>AWB MODE 1</td><td>The following auto white balance adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>AWB MODE 1</td></tr>
<tr><td>10</td><td>WB DIRECT</td></tr>
<tr><td>F0</td><td>WB FREE</td></tr>
<tr><td>01</td><td>3200k Data fetch 1</td></tr>
<tr><td>23</td><td>3200k Data fetch 2</td></tr>
</table></td><td></td></tr>
</table>

Table 3-2 (8).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
EF		———		
F0		———		
F1		———		
F2		———		
F3		———		
F4		———		
F5		———		
F6		———		
F7		———		
F8		———		
F9		———		
FA		———		
FB		———		
FC		———		
FD		———		
FE		———		
FF		———		

Table 3-2 (9).

3-2-4. Checkpoint Array

Most measurement points for adjustment of the camera block are concentrated on the checkpoint array of the VC-67P board.

Solder a short lead wire, etc. to the terminal required for adjustment and connect an oscilloscope. Table 3-3 shows the terminal numbers and signal names of the checkpoint array.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	N.C	B1	N.C
A2	PG CONT	B2	N.C
A3	N.C	B3	Y (LPF) OUT
A4	N.C	B4	V SUB
A5	VAP OUT	B5	VAP SLICE
A6	TP	B6	N.C
A7	WB-G	B7	Y_H GAIN
A8	CAM Y	B8	Y_2 GAIN
A9	YH	B9	N.C
A10	CAM C	B10	GND
A11	YH OUT 1	B11	IRIS OUT

Table 3-3.

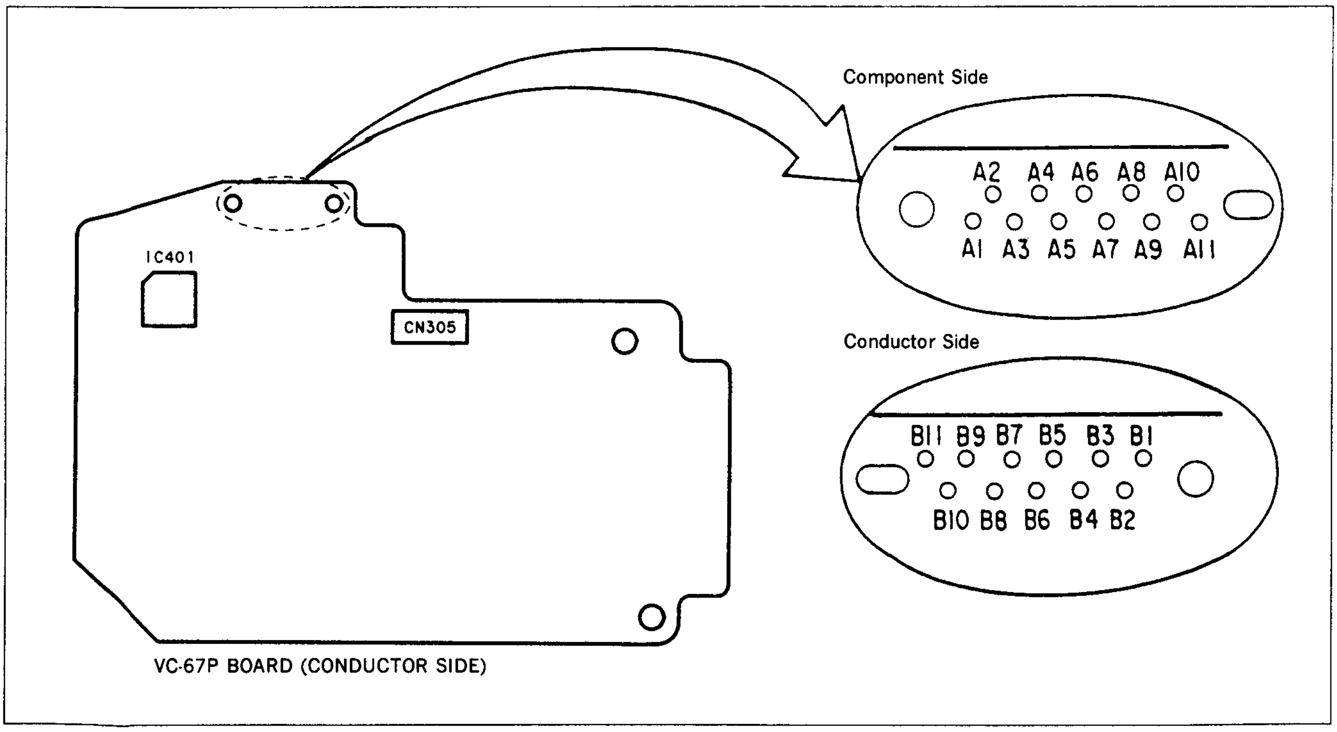

Component Side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Conductor Side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2
IC401
CN305
VC-67P BOARD (CONDUCTOR SIDE)

Fig. 3-8.

3-2-5. AF Microcomputer Data Reader Jig

The AF microcomputer data reader jig converts adjustment serial data outputted from the AF microcomputer (AF-54P board CN801) (different data are outputted depending on the adjustment mode, such as HALL (iris) state, focus state, focus motor speed, zoom ring position, etc.) into 2-digit hexadecimal numbers and indicates on the LED.

[Connection]

Connect as shown in the figure below :

adjustment mode, such as HALL (iris) state, focus state, focus

Note :

Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the number is kept to 10K, the adjustment data can not change because of the difference of the impedance.)

When adjusting the old-model Handy Cam, 100kΩ is allowed to perform the adjustment.

motor speed, zoom ring position, etc.) into 2-digit hexadecimal numbers and indicates on the LED.

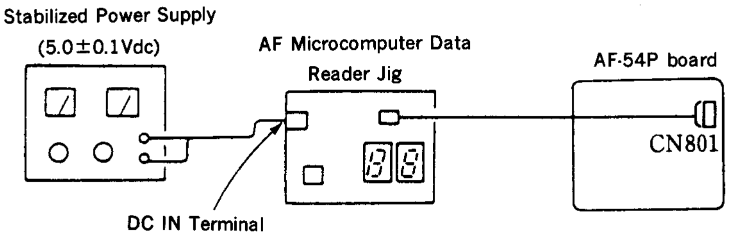


Fig. 3-9.

3-2-6. Data Processing

In order to obtain adjustment data in some adjustment items, it is necessary to compute the display data (hexadecimal number) of the AF microcomputer data reader jig and adjustment remote control. In this case, convert the hexadecimal number into the decimal number before computation, convert its computed result back into the decimal number to assume it as the adjustment data. Table 3-4 shows a hexadecimal-decimal conversion table.

Hexadecimal — Decimal Conversion Table

Higher Digit of Hex. No. / Lower Digit of Hex. No.	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② ↓ D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note : Values in parentheses are those displayed on the AF microcomputer reader jig or adjustment remote control.

(Example) When the AF microcomputer reader jig or adjustment remote control displays "BD (bd)";
Since the higher digit of the hexadecimal number is B (b) and its lower digit is D (d) , the decimal number to be obtained is "189" at an intersecting point of ① and ② in the table above.

Table. 3-4.

3-3. ADJUSTMENT OF CAMERA SYSTEM

- In principle, all adjustments must be made in accordance with Adjustment procedure.
- When replacing lens, do not forget to make the following adjustment.

[Adjustment Sequence]

1) 3-3-3. Flange Back Adjustment
2) 3-3-26. MACRO area Adjustment
3) 3-3-7. HALL Adjustment
4) 3-3-8. IRIS Adjustment
5) 3-3-9. Shutter IN/OUT Adjustment

- When replacing CCD imager, do not forget to adjust the camera system property.

3-3-1. Prime Oscillation Adjustment (CD-20P Board)

Object	Color bar chart standard picture frame
Measurement point	DT-77P board pin ② (CL143)
Measurement instrument	Frequency counter
Adjustment element	CT122
Specified value	14187500±71Hz

Note : Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 14187500±71Hz with CT122.

3-3-2. PLL Adjustment (CD-20P Board)

Object	Optional
Measurement point	See Fig. 3-10.
Measuring instrument	Digital voltmeter
Adjustment element	CT121
Specified value	2.5±0.2Vdc

[Adjustment Method]

1) Adjust to 2.5±0.2Vdc with CT121.

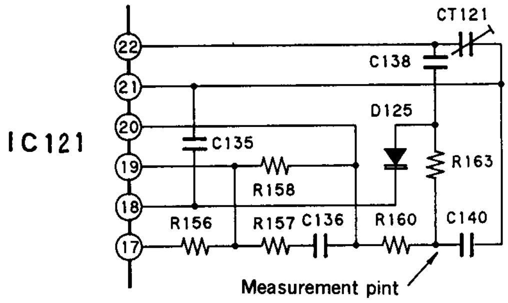


Fig. 3-10.

3-3-3. Flange Back Adjustment

Object	Siemens star (at 2 m in front of the lens datum level ⌀ mark)
Measurement point	Check with the monitor TV.
Measuring instrument	
Adjustment element	Flange back adjusting pin
Tools	Phillips screwdriver

[Adjustment Method]

1) Press the FOCUS button (CK-40P board S671) to select the MANUAL mode.
2) Place the Siemens star at a distance of 2 m in front of the lens datum level (refer to Fig. 3-2).
3) Adjust a camera block position to center the Siemens star on the monitor screen with the monitor screen.
4) Check that the lens zoom lever can be moved fully to the WIDE end (8.5 mm) and TELE end (68 mm), respectively, and fix it at the WIDE end. (When this is done, check also zooming operation on the monitor screen.)
5) Set the lens focusing mark at the center of "2".

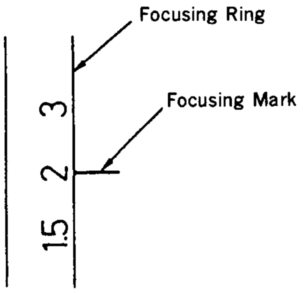


Fig. 3-11.

6) Loosen the flange back setscrew ❶ with the Phillips screwdriver. (Refer to Fig. 3-13)
7) Viewing the monitor screen, turn the glange back adjusting pin ❷ to make clearest the wedge located at the center of the Siemens star on the screen. (Turn it 2 to 3 times to the right and left to check the wedge to be clearest.)

   Note : Do not turn the adjusting pin excessively in one direction at a time.
8) Holding the flange back adjusting pin ❷ not to turn it further, tighten the flange back setscrew ❶.
9) With the zoom lever fixed at the WIDE end, turn the focusing ring and stop it at a position which provides the clearest image of the wedge. Check that the focusing ring is within the range shown in Fig. 3-12 at this time.

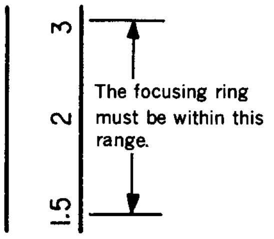


Fig. 3-12.

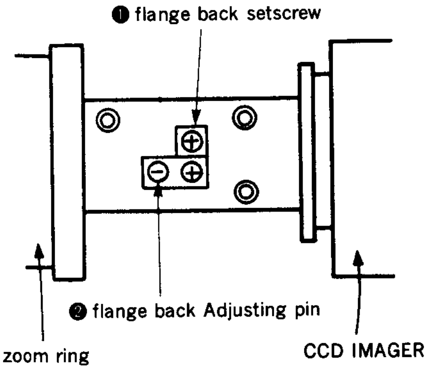


Fig. 3-13.

10) Fix the zoom lever at the TELE end.
11) Turn the focusing ring and stop it at a position which provides the clearest wedge image. When this is done, check that the focusing ring is within a range of ±1.5mm from the center of "2".

3-3-4. Camera DC-DC Converter Voltage Check (VC-67P Board/CD-20P Board)

Measuring isntrument	Digital voltmeter
15V check	
Measurement point	CN101 pin ① (CD-20P Board)
Specified value	$15.0 \pm 0.2V_{DC}$
−9V check	
Measurement point	CN101 pin ② (CD-20P Board)
Specified value	$-9.00 \pm 0.15V_{DC}$
4.9V check	
Measurement point	CN101 pin ③ (CD-20P Board)
Specified value	$4.9 \pm 0.1V_{DC}$
CAM 4.9V check	
Measurement point	CN304 pin ④ (VC-67P Board)
Specified value	$4.9 \pm 0.1V_{DC}$

[Checking Method]

1) Each supply voltage must meet the specified value.

3-3-5. EVR Initial Setting of adjustment page F

Set to the following initial settings of the adjustment data only when the CCD IMAGER was replaced.

Make initial setting of adjustment data when the EVR/AWB microcomputer is replaced.

(Pre-replacement microcomputer data will do.)

Adjustment Address	Adjustment Data Initial Value
0E (Y LEVEL)	9C
0F (VAP GAIN)	90
12 (VSUB CONT)	3A
13 (PG CONT)	5A
14 (Yr CONT)	AE
15 (WHITE CLIP)	FF
18 (MAX GAIN)	E0
19 (IRIS REF)	4C
1F (FADER CONT)	00
25 (IN OUT)	00
26 (M12-THR)	20
27 (KATAMUKI)	04
28 (FA-WM)	03
2D (FA-SML)	00
2F (FH-SML)	00
30 (LOW-F-SPEED)	32
31 (MAN-F-SPEED)	22

Adjustment Address	Adjustment Data Initial Value
32 (STEP-A)	02
33 (END-SENS-V)	20
34 (ZOOM-POSI 1)	0F
35 (ZOOM-POSI 2)	3C
36 (ZOOM-POSI 3)	6B
37 (ZOOM-POSI 4)	9A
38 (ZOOM-POSI 5)	CA
39 (FOCUS-POSI 1)	48
3A (SEARCH-V)	00
3B (BACK RUSH 2)	02
3C (BACK RUSH-MODE 3)	05
3D (ZOOM-TAN-MASK)	50
3E (ZOOM-END-V)	01
3F (ZOOM-MODOSI)	00
40 (BACK RUSH-ZOOM)	08
41 (NOT WIDE STOP)	00
42 (MODE 12 NG THR)	02
43 (FA-BASE H-IN)	20
44 (FA-BASE-OUT)	0F
47 (MODE 12 NG LIMIT H)	02
48 (MODE 12 NG LIMIT L)	00
49 (M2 HANTEN)	04
4A (MODE 5 THR 1)	06
4B (YOGIRI-IN)	1E
4C (MODE 5 FH FLT)	01
4D (MODE 5 THR 2 IN)	70
4E (MODE 5 THR 3)	1E
4F (FH-NG-COUNT)	1E
50 (TYUU WAKU)	00
51 (YOGIRI-OUT)	1E
52 (MODE 5 THR 20 OUT)	1E
53 (AF IRIS IN OUT)	B9
54 (MACRO TIME OUT H)	07
55 (MACRO TIME OUT L)	00
56 (MACRO SEARCH)	01
57 (SEISHI)	02
58 (ZOOM-SPEED 1)	20
59 (ZOOM-SPEED 2)	20
5A (ZOOM-SPEED 3)	20
5B (ZOOM-SPEED 4)	53
5C	00
5D	02

Adjustment Address	Adjustment Data Initial Value
60 (IRIS REF NOR)	60
61 (IRIS REF PO)	60
62 (IRIS REF SP)	60
63 (IRIS DATA 1)	BE
64 (GAIN-REF)	30
65 (GAIN-MAX)	E0
66 (EMG AGC)	A0
67 (EMG-AGC-HYS)	05
68 (EMG-AE (H))	06
69 (EMG-AE (L))	00
6A (EMG-AE-HYS (H))	01
6B (MAX SHUT-PO (H))	00
6C (MAX SHUT-PO (L))	CE
6D (MAX SHUT-SP (H))	00
6E (MAX SHUT-SP (L))	E6
6F (REF-WIDTH (H))	01
70 (REF-WIDTH (L))	00
71 (SHUT-MULTI (H))	06
72 (SHUT-MULTI (L))	00
73 (SHUT-COUNT 1)	06
74 (SHUT STEP-MULTI)	02
75 (IRIS-OPEN)	20
76 (REF-TURBO (H))	06
77 (REF-TURBO (L))	00
78 (TURBO-WIDTH (H))	01
79 (TURBO-WIDTH (L))	00
7A (TURBO-TR (H))	01
7B (TURBO-TR (L))	00
7C (SHUT-COUNT 2)	01
7D (SHUT-COUNT 3)	01
80 (USER R-Y GAIN)	10
81 (USER B-Y GAIN)	0D
82 (USER B-Y HUE)	0D
83 (USER R-Y HUE)	0C
84 (USER SHP LEVEL)	0A
85 (USER Y LEVEL)	0C
96 (SHUTTER IN)	B1
97 (SHUTTER OUT)	8B
AC (BTM SLP R)	30
AD (BTM SLP B)	70
AE (MDL SLP R)	40
AF (MDL SLP B)	40

Adjustment Address	Adjustment Data Initial Value
B1 (TOP SLP B)	10
B2 (KEIKO R)	80
B3 (KEIKO B)	30
B4 (BTM UP)	CF
B5 (BTM DWN)	98
B6 (MDL UP)	BE
B7 (MDL DWN)	9B
BA (KEIKO)	C4
BB (KEIKO DWN)	AC
BC (R TOP LMT)	A0
C3 (B DOWN LMT)	26
C4 (LL LMT)	06
C5 (TM DIVID)	6E
C6 (BM DIVID)	41
C7 (DELAY TM)	0A
C8 (FAST TM)	30
C9 (OUT HYS OFF)	15
CA (OUT B HYS)	0D
D0 (SYSTEM)	01
EC (AWB MODE 3)	01
ED (AWB MODE 2)	00
EE (AWB MODE 1)	00

Table. 3-5.

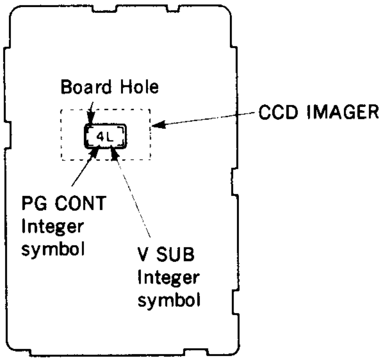
[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment data for each adjustment address to the initial value with the adjustment remote control.
3) Change the adjustment address in order to memorize the last adjustment data.

3-3-6. PG CONT/V SUB Adjustment (VC-67P Board)

Note : PG CONT specified voltage and V SUB specified volatage are indicated by the two digits on CCD imager.

VC-67P BOARD (CONDUCTOR SIDE)



- PG CONT

Integer symbol	Voltage (V)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

- V SUB

Integer symbol	Voltage (V)	Integer symbol	Voltage (V)	Integer symbol	Voltage (V)
A	7.0	J	11.0	S	15.0
B	7.5	K	11.5	T	15.5
C	8.0	L	12.0	U	16.0
D	8.5	M	12.5	V	16.5
E	9.0	N	13.0	W	17.0
F	9.5	P	13.5	X	17.5
G	10.0	Q	14.0	Y	18.0
H	10.5	R	14.5	Z	18.5

Example : For 「4L」 display,
•PG CONT=2.5V
•V SUB=12.0V

Fig. 3-14.

A. PG CONT Adjustment

Object	Not used
Measurement point	Checkpoint array pin(A2)(PG CONT)
Measuring instrument	Digital voltmeter
Adjustment page	F
Adjustment address	13 (PG CONT)
Specified value	(CCD imager specified voltage) $\pm 0.1V_{dc}$

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 13 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ± 0.1Vdc with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

B. V SUB Adjustment

Object	Not used
Measurement point	Checkpoint array pin(B4)(V SUB)
Measuring equipment	Digital voltmeter
Adjustment page	F
Adjustment address	12 (V SUB)
Specified value	(CCD imager specified voltage) ±3%

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 12 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ±3% with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

3-3-7. HALL Adjustment (AF-54P Board)

Object	All white chart All black (Put a black cap over lens)
Measurement point	CN801
Measuring instrument	AF μ COM data reader jig
Adjustment page	F
Adjustment address	1B (HALL GAIN) 1C (HALL OFFSET)
Specified value	1B : 03 1C : C or D

[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 05 with the adjustment remote controller.
3) Make all white chart in the color bar standard frame.
4) Set the adjustment address 1B and the adjustment data 20 with the adjustment remote controller. Set the adjustment address 1C and adjustment data 00.
5) Read this data of the AF microcomputer data reading jig. (Set this data as W_2 and input to the address 8B)
6) When this value is over F8, adjust the address 1C to F8± 03. Input this value of 1C to the address 87. When the value is below F8, set the data 00 of the address 87.
7) Set the adjustment address 1B and the adjustment data 00 with the adjustment remote controller.
8) Read this data of the AF microcomputer data reading jig. (Set this data as W_1 and input to the address 8A)
9) Cover the lens with black cap and make all black. (Open iris.)
10) Read this data of the AF microcomputer data reading jig. (Set this data as K_1 and input to the address 88)
11) Set the adjustment address 1B and the adjustment data 20 with the adjustment remote controller.
12) Read this data of the AF microcomputer data reading jig. (Set this data as K_2 and input to the address 89)
13) Obtain C by the following formula.

$$C=\frac{(C0+K_1-W_1)\times\triangle K+03+\triangle W}{\triangle K+\triangle W}\quad\begin{pmatrix}\triangle K=K_1-K_2\\ \triangle W=W_2-W_1\end{pmatrix}$$

14) Set the adjustment address 1B and the adjustment data 00 with the adjustment remote controller. Adjust the adjustment address 1C so that the data of the AF microcomputer data reading jig is D.
15) Set the adjustment address 1B with the adjustment remote controller. Change the adjustment data and set the data of the AF microcomputer data reading jig to 03.
16) Make all white chart in the color bar standard frame and read the data of this AF microcomputer reading jig. (Set this data as W_0 . When $W_0=C0\pm01$, the adjustment is completely performed. So set the adjustment data of the adjustment address EB to 00. When the above range is not satisfied, go to the following procedures.)
17) Obtain E by the following formula.

$$E=\frac{C0\times\triangle K+W_0\times\triangle W}{\triangle K+\triangle W}\quad\begin{pmatrix}\triangle K=K_1-K_2\\ \triangle W=W_2-W_1\end{pmatrix}$$

18) Set the adjustment address 1C with the adjustment remote controller. Change the adjustment data and set the data of the AF microcomputer data reading jig to E.
19) Set the adjustment address 1B with the adjustment remote controller. Chage the adjustment data and set the data of the AF microcomputer data reading jig to C0.
20) Cover the lens with black cap and make all black. (Open iris.)
21) Confirm that the data of the AF microcomputer data reading jig is 03±02.
22) Set the adjustment address EB and the adjustment data 00 with the adjustment remote controller.
23) Change the adjustment address in order to store the adjustment data.

3-3-8. IRIS Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement point	Checkpoint array pin (B11) (IRIS OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	19 (IRIS)
Specified value	150±10 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 19 with the adjustment remote control.
2) With no ND filter attached, change the adjustment data with the adjustment control to adjust the IRIS OUT signal level to 150±10 mV.
3) Attach the ND filter 0.5 (0.4+0.1) in front of the lens and check that the signal level changes smoothly.
4) Remove the ND filter and check that the signal level is 150±20 mV.
5) When the specified value is not met, repeat the steps 2) through 4).
6) Change the adjustment address in order to store the adjustment data.

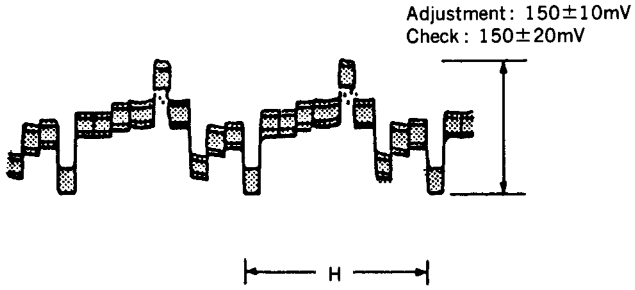


Fig. 3-15.

3-3-9. Shutter IN/OUT Adjustment (AF-54P Board)

Object	White pattern standard picture frame
Filter	ND filter: 0.4×2pcs., 0.1×1pc.
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	96 (SHUTTER IN) 97 (SHUTTER OUT)
Specified value	Data A Data B

[Adjustment Method]

1) Select the adjustment page F and the adjustment address EB with the adjustment remote control.
2) Attach the ND filter 0.8 (0.4+0.4) to the front of the lens, and read the AF jig data (This data is assumed as data A.)
3) Detach the ND filter 0.8, and attach the ND filter 0.5 (0.4+0.1).
4) Read the AF jig data. (This data is assumed as data B)
5) Set the adjustment address 96 by adjustment remote control and enter to the adjustment data A.
6) Set the adjustment address 97 by adjustment remote control and enter to the adjustment data B.
7) Change the adjustment address to EB to set the adjustment data to 00.
8) Change the adjustment address in order to store the adjustment data.

3-3-10. AGC Adjustment (VC-67P Board)

Note : When there is much noise, measure by inserting 5.6kΩ resistance.

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (B3) (Y (LPF) OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1A (AGC)
Specified value	180±5 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 1A with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to set the Y (LPF) signal level to 180±5 mV.
3) Change the adjustment address in order to store the adjustment data.

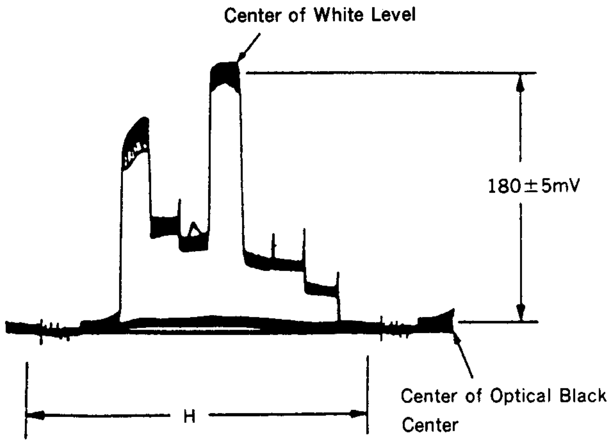


Fig. 3-16.

3-3-11. Matrix Adjustment

(1) Y1 Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (A5) (VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	07 (Y_1 Gain)
Specified value	$Y_0-Y_1=0\pm5$mV

[Preparation]

1) Short the checkpoint array pin (B8) (Y_2 Gain) and pin (B5) (VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 07 by the adjustment remote control.
4) Change the adjustment data and set the Y_0-Y_1 waveform to be a straight line. (There should not be difference.)
5) Change the adjustment address in order to store the adjustment data.
6) Open the checkpoint array pin (B8) and pin (B5).

Note : After the adjustment, be sure to adjust the matrix (2) Y_2 Gain Adjustment.

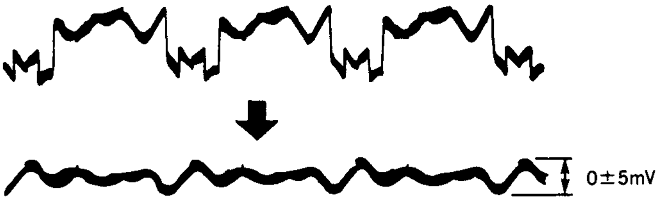


Fig. 3-17.

(2) Y_2 Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	06 (Y_2 GAIN)
Specified value	0±5mV

[Preparation]

1) Short the chickpoint array pin(B5)(VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F by the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 06 by the adjustment remote control.
4) Change the adjustment data and set the $(Y_1 - \frac{Y_0+Y_2}{2})$ waveform to be a straight line. (There should not be difference.)
5) Select the adjustment address 0F by the adjustment remote control and set the adjustment data to be 90.
6) Change the adjustment address in order to store the adjustment data.
7) Open the checkpoint array pin(B5.)

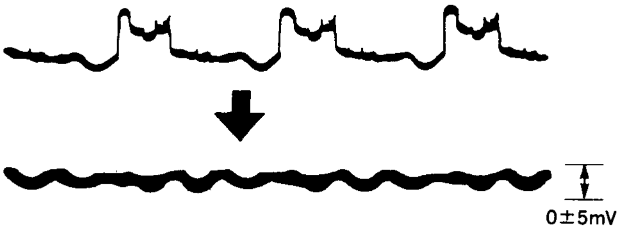


Fig. 3-18.

(3) C_1 Gain Adjustment

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	03 (C_1 GAIN)
Specified value	Minimize the divided bright point. Cyan, green ···Within 2.0 mm Magenta ···Within 1.0 mm Others ···Within 0.5 mm

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 03 by the adjustment remote control.
2) Change the adjustment data to coincide each color bright point.
3) Change the adjustment address in order to store the adjustment data.

Specified Values When Vectorscope is used.

Specified value :Cyan, Green. . . . Within 2.0mm
Magenta. . . . Within 1.0mm
Others. . . . Within 0.5mm

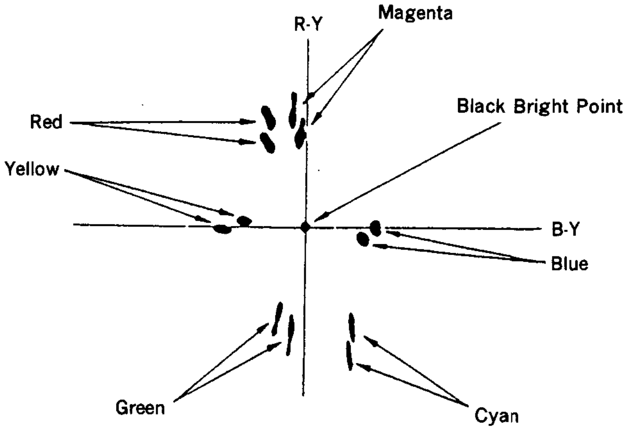


Fig. 3-19.

3-3-12. Y_H Level Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (A6) (TP)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	08 (Y_H GAIN)
Specified value	0±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 08 by the adjustment remote control.
2) Change the adjustment data by the adjustment remote control in order that the output is a straght line. (There should not be difference : 0+5mV)
3) Change the adjustment address in order to store the adjustment data.

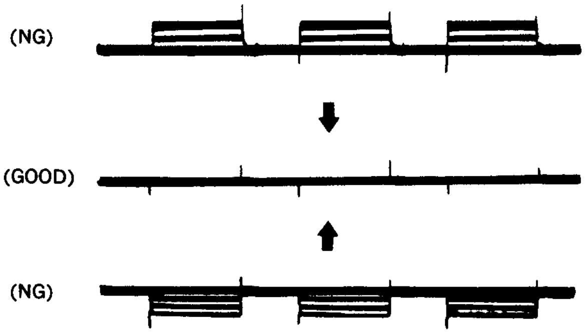


Fig. 3-20.

3-3-13. Chroma Level Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (A7) (WB-G)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	11 (C LEVEL)
Specified value	320±20mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 11 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the White level to 320±20 mV.
3) Change the adjustment address in order to store the adjustment data.

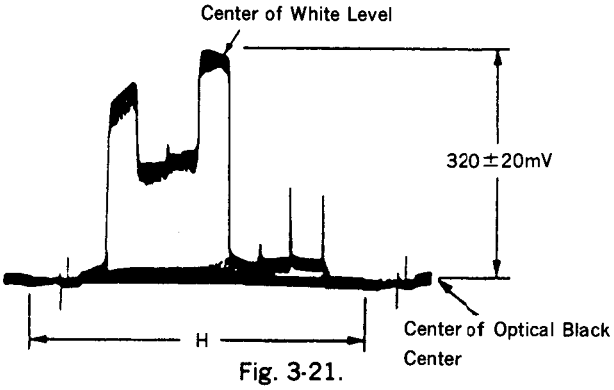


Fig. 3-21.

3-3-14. Sync. Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin Ⓐ⑧ (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	16 (SYNC LEVEL)
Specified value	150±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 16 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the sync. level to 150±5mV.
3) Change the adjustment address in order to store the adjustment data.

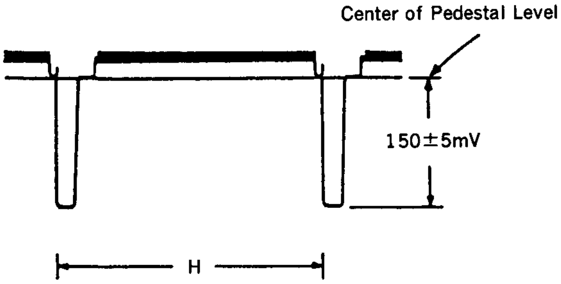


Fig. 3-22.

3-3-15. Setup Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin Ⓐ⑧ (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	10 (SET UP) 18 (MAX GAIN)
Specified value	15±5mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 18 with the adjustment remote control, make note of the adjustment data of this address (data F), and then, set the adjustment data to 00.
3) Select the adjustment address 10 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the setup level to 15±5mV.
5) Select the adjustment address 18 and enter to the adjustment data F.
6) Change the adjustment address in order to store the adjustment data.

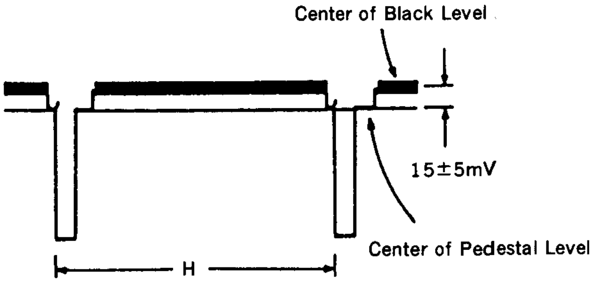


Fig. 3-23.

3-3-16. White Clip Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin Ⓐ8 (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	15 (WC) 0E (Y LEVEL)
Specified value	420±10mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjutment address 0E with the adjustment remote control, make note of the adjustment data of this address (data G), and then, set the adjustment data to FF.
3) Set the adjustment address to 15 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the white clip level to 420±10mV.
5) Select the adjustment address 0E and enter to adjustment data F.
6) Change the adjustment address in order to store the adjustment data.
7) Make Y level adjustment as described in 3-3-17.

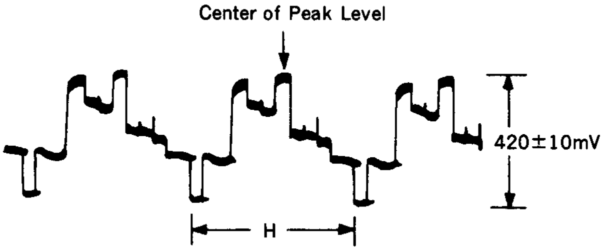


Fig. 3-24.

3-3-17. Y Level Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin Ⓐ8 (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0E (Y LEVEL)
Specified value	320±5mV

[Adjustment Method]

1) Check that the specified value in "3-3-16 White Clip Adjustment" is met.
2) Select the adjustment page F and the adjustment address 0E with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control and adjust the Y signal level to 320±5mV.
4) Change the adjustment address in order to store the adjusment data.

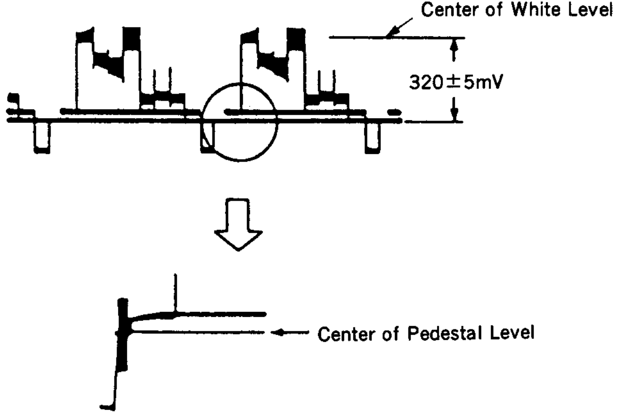


Fig. 3-25.

3-3-18. H Aperture Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0D (SHP LEVEL)
Specified value	40±5mV

[Adjustment Method]

1) Turn the focusing ring to maximize the aperture level (waveform peak).
2) Select the adjustment page F and the adjustment address 0D with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to set the aperture level (lower peak between "green" and "white") to a point 40±5mV above the pedestal level.
4) Change the adjustment address in order to store the adjustment data.

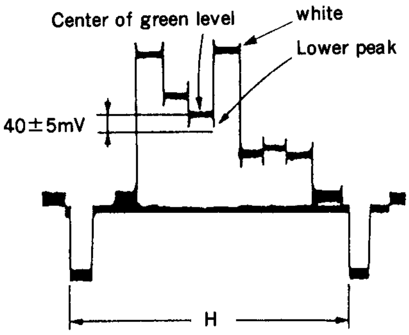


Fig. 3-26.

3-3-19. Max. Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Filter	ND filter: 1.0×2pcs., 0.4 and 0.1×2pcs. each
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	18 (MAX GAIN)
Specified value	150±5mV

[Adjustment Method]

1) Cover the lens with the ND filter 2.6 (1.0+1.0+0.4+0.1+0.1).
2) Select the adjustment page F and the adjustment address 18 with the adjustment remote control.
3) Change the adjustment address with the adjustment remote control to adjust the Y signal level to 150±5mV.
4) Change the adjustment address in order to store the adjustment data.

Note : Although the ND filter is combined by using 5 pcs, if your ND filter is combined by using 3 pcs or less, resulting in 2.5, this combination should be available.

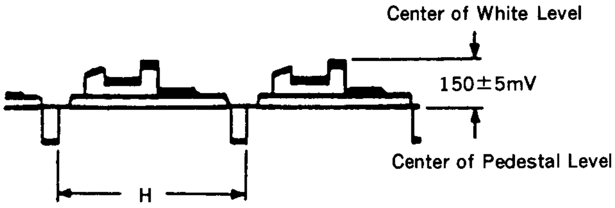


Fig. 3-27.

3-3-20. Burst Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin (A10) (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	17 (BURST LEVEL)
Specified value	150±5mVp-p

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 17 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the burst level to 150±5mVp-p.
3) Change the adjustment address in order to store the adjustment data.

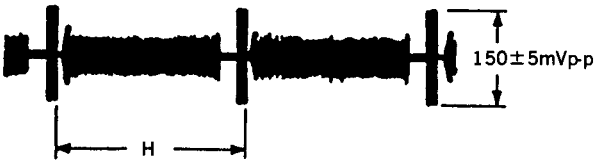


Fig. 3-28.

3-3-21 (A). Pre-white Balance Adjustment (With Vectorscope)

Object	All white pattern
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	The center of a white bright point must be within a circle of ϕ 1 mm centering around the origin

[Adjustment Method]

1) Maximize the gain of vectorscope.
2) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to coincide the white bright point with the origin.
4) Select the adjustment address 04.
5) Change the adjustment data to coincide the white bright point with the origin.
6) Repeat the steps 2) through 5).
7) Return the gain of vectorscope to CAL, and make sure that center of the bright point is located inside a circle of 1 mm diameter apart from the origin.
8) Change the adjustment address in order to store the adjustment data.

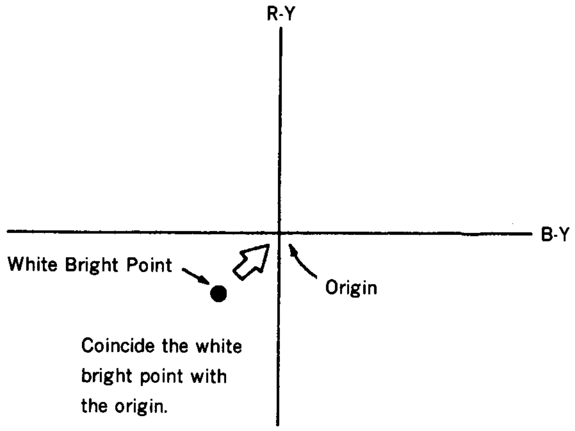


Fig. 3-29.

3-3-21 (B). Pre-white Balance Adjustment (With Oscilloscope) (VC-67P Board)

Object	All white pattern
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin (A10) (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	Chroma signal amplitude minimum

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to minimize a chroma signal amplitude.
3) Select the adjustment address 04.
4) Change the adjustment data to minimize the chroma signal amplitude.
5) Repeat the steps 1) through 4).
6) Change the adjustment address in order to store the adjustment data.

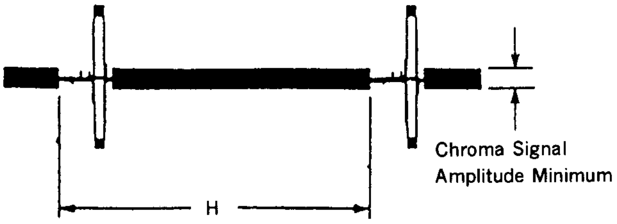


Fig. 3-30.

3-3-22. Color Reproducibility Adjustment (With Vectorscope)

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	09 (R-Y GAIN) 0A (B-Y GAIN) 0B (R-Y HUE) 0C (B-Y HUE)
Specified value	All color bright points must be within a color reproduction frame.

Note : Burst level adjustment and pre-white balance adjustment must have been completed.

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Change the adjustment data of each adjustment address with the adjustment remote control to collect all the color bright points within the color reproduction frame.
3) Change the adjustment address in order to store the adjustment data.

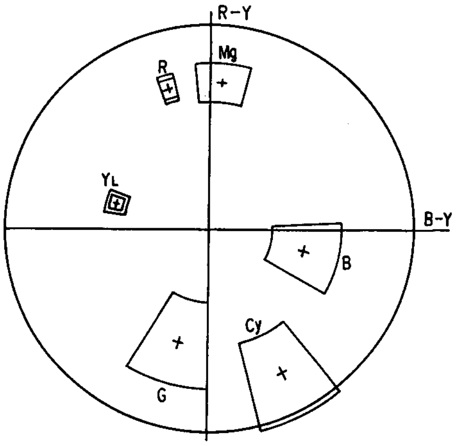


Fig. 3-31.

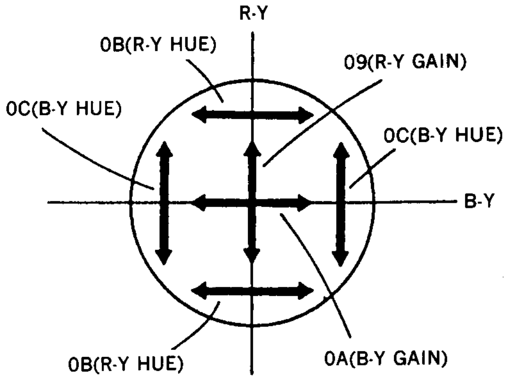


Fig. 3-32. Adjustment Addresses and Bright Point Moving Directions

3-3-23. Auto White Balance Adjustment

Note 1 : Be sure to make "preset adjustment" and "auto white balance adjustment" in that order.

(1) Preset Adjustment (VC-67P Board)

Object	White pattern standard picture frame
Adjustment page	F
Adjustment address	EE (AWB MODE 1)

Note 1 : Make preset adjustment 30 seconds or more after turning on the power.

Note 2 : When redoing preset adjustment, turn off the power once, and then, turn it on again.

[Adjustment Method]

1) Turn off/on the power.
2) Obtain a picture of white pattern for over five seconds. (AF switch is turned off.)
3) Select the adjustment page F with the adjustment remote control.
4) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 01.
5) Change the adjustment address in order to store the adjustment data. (3200K data fetch 1)
6) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 23.
7) Change the adjustment address in order to store the adjustment data. (3200K data fetch 2)
8) Check that the LANC data is changed and the adjustment address 95 is selected.
9) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 00.
10) Change the adjustment address in order to store the adjustment data.
11) Make auto white balance adjustment.

(2) Auto White Balance Adjustment (VC-67P Board)

Note 1 : Be sure to make this adjustment after preset adjustment.

Object	All white pattern
Filter	Color temperature compensation filter C14 (C12+C2)
Measuring instrument	Vectorscope
Measurement point	VIDEO OUT terminal
Adjustment page	F
Adjustment address	01 (R CONT) 02 (B CONT) 98 (START R) 99 (START B) 9A (R OUT DOOR) 9B (B OUT DOOR) A0 (Ra) A1 (Rb) A2 (Rc) A3 (Ba) A4 (Bb) A5 (Bc) A6 (R/B TOP) A7 (R/B MDL) A8 (R/B BTM) A9 (B/R TOP) AA (B/R MDL) AB (B/R BTM) B0 (TOP SLP R) B8 (TOP UP) B9 (TOP DWN) BD (R DWN LMT) BE (B DWN LMT) BF (B IN TOP) C0 (B IN MAX) C1 (B OUT MIN) C2 (B OUT DWN)
Specified value	The white and black bright points must coincide.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address EE (AWB MODE1) with the adjustment remote control and enter the adjustment data 10. (Set of WB DIRECT)
3) Cover the lens with the C14 filter.
4) Change the adjustment data of the adjustment addresses 01 and 02 with the adjustment remote control to coincide the white bright point with the origin.
   At this time, assume the data of the adjustment address 01 as Rc14 and that of the adjustment address 02 as Bc14.

5) Input the value on the AWB adjustment data list (Refer to page 45) from the value of Rcl4 and Bcl4 to each address, and then proceed to the item 16). If the value does not come under the list, caluculate the adjustment data by the calculation from item 6).

6) Make that the adjustment address 01 data of the adjustment remote control on the item 4) is Cl and the adjustment address 02 data is C2.

7) Convert C_1 into a decimal number to assume it as C_1', and C_2 as well as C_2'. (Refer to Table 3-4 "Hexadecimal-Decimal Conversion Table")

8) Obtain D_{9A}' anb D_{9B}' by the following formula.

$D_{9A}' = C_1' + 2 \qquad D_{9B}' = C_2' + 6$

9) Convert D_{9A}' and D_{9B}' into a hexadecimal number and assume its value as D_{9A} and D_{9B}. (Round fractions below a decimal number to the nearest whole number)

10) Select the adjustment address 9A and enter the adjustment data D_{9A}.

11) Select the adjustment address 9B and enter the adjustment data D_{9B}.

12) Obtain A and B in the hexadecimal numbers by the following formula, and convert them into the decimal numbers. The values are A′ and B′.

$A = 5A - D_{9A}$

$B = D_{9B} - 50$

13) Obtain the adjustment data of each adjustment address in the decimal numbers by the following formula.

$D_{A0}' = 90 - A' \times 1.12$

$D_{A1}' = D_{9A}'$

$D_{A2}' = 90 - A' \times 0.593$

$D_{98}' = D_{A2}'$

$D_{BE}' = B' \times 2 + 80$

$D_{BF}' = D_{9B}'$

$D_{C0}' = B' \times 0.84 + 80$

$D_{C1}' = D_{C0}'$

$D_{C2}' = B' \times 0.3 + 80$

$D_{A3}' = B' \times 1.34 + 80$

$D_{99}' = D_{A5}'$

$D_{A4}' = D_{9B}'$

$D_{A5}' = B \times 0.467 + 80$

$D_{BD} = 90 - A' \times 1.67$

14) The above items, calculate by decimal and input by hexadecimal.

15) The below items, calculate by hexadecimal and input the adjustment data to each adjustment address.

$$D_{A6} = \frac{(D_{A1} - D_{A0}) \times 40}{(D_{A3} - D_{A4})}$$

$$D_{A7} = \frac{(D_{A2} - D_{A1}) \times 40}{(D_{A4} - D_{A5})}$$

$$D_{A8} = \frac{(5A - D_{A2}) \times 40}{(D_{A5} - 50)}$$

$$D_{A9} = \frac{(D_{A3} - D_{A4}) \times 10}{(D_{A1} - D_{A0})}$$

$$D_{AA} = \frac{(D_{A4} - D_{A5}) \times 10}{(D_{A2} - D_{A1})}$$

$$D_{AB} = \frac{(D_{A5} - 50) \times 10}{(5A - D_{A1})}$$

$$D_{B0} = D_{A9}$$

$$D_{B8} = \frac{(D_{A1} + 0A) \times D_{B0} + D_{A4} \times 10}{40}$$

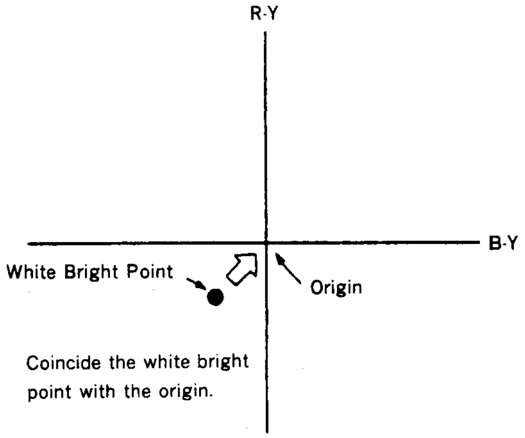
$$D_{B9} = \frac{(D_{A1} - 11) \times D_{B0} + D_{A4} \times 10}{40}$$

16) Select the adjustment address EE and input the adjsutment data F0.

17) Change the adjustment addresses 01 and 02 with the adjustment remote control to coincide the white bright point with the origin.

18) Select the adjustment address EE and enter the adjustment data 00.

19) Change the adjustment address in order to store the adjustment data.



Coincide the white bright point with the origin.

Fig. 3-33.

•AWB Adjustment Data Table

Rc14;	Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	9	BD	BE	BF	C0	C1	C2
3D	78	4A	65	3F	7E	3C	3F	4A	8E	7E	65	C	1C	31	55	24	15	55	81	5D	2C	AC	7E	77	77	5E
3D	79	4A	66	3F	7F	3C	3F	4A	8F	7F	66	C	1C	2F	55	24	16	55	81	5D	2C	AE	7F	77	77	5E
3D	7A	4A	66	3F	80	3C	3F	4A	90	80	66	C	1B	2F	55	26	16	55	81	5D	2C	B0	80	78	78	5E
3D	7B	4A	67	3F	81	3C	3F	4A	92	81	67	B	1B	2D	5B	26	17	5B	88	61	2C	B2	81	79	79	5F
3D	7C	4A	67	3F	82	3C	3F	4A	93	82	67	B	1A	2D	5B	27	17	5B	88	62	2C	B4	82	7A	7A	5F
3D	7D	4A	68	3F	83	3C	3F	4A	94	83	68	B	1A	2B	5B	27	18	5B	88	62	2C	B6	83	7B	7B	5F
3D	7E	4A	68	3F	84	3C	3F	4A	96	84	68	B	19	2B	60	29	18	60	8F	66	2C	B8	84	7C	7C	60
3D	7F	4A	69	3F	85	3C	3F	4A	97	85	69	B	19	29	60	29	19	60	8F	66	2C	BA	85	7D	7D	60
3D	80	4A	69	3F	86	3C	3F	4A	98	86	69	B	18	29	60	2A	19	60	8F	67	2C	BC	86	7D	7D	60
3D	81	4A	6A	3F	87	3C	3F	4A	9A	87	6A	A	18	27	65	2A	1A	65	95	6B	2C	BE	87	7E	7E	61
3D	82	4A	6A	3F	88	3C	3F	4A	9B	88	6A	A	17	27	65	2C	1A	65	96	6B	2C	C0	88	7F	7F	61
3D	83	4A	6B	3F	89	3C	3F	4A	9C	89	6B	A	17	26	65	2C	1B	65	96	6B	2C	C2	89	80	80	61
3D	84	4A	6B	3F	8A	3C	3F	4A	9E	8A	6B	A	17	26	6B	2D	1B	6B	9C	6F	2C	C4	8A	81	81	61
3D	85	4A	6C	3F	8B	3C	3F	4A	9F	8B	6C	A	17	25	6B	2D	1C	6B	9C	6F	2C	C6	8B	82	82	62
3D	86	4A	6C	3F	8C	3C	3F	4A	A0	8C	6C	A	16	25	6B	2F	1C	6B	9D	70	2C	C8	8C	82	82	62
3D	87	4A	6C	3F	8D	3C	3F	4A	A2	8D	6C	9	15	25	70	30	1C	70	A3	74	2C	CA	8D	83	83	62
3D	88	4A	6D	3F	8E	3C	3F	4A	A3	8E	6D	9	15	23	70	30	1D	70	A3	74	2C	CC	8E	84	84	63
3D	89	4A	6D	3F	8F	3C	3F	4A	A4	8F	6D	9	15	23	70	31	1D	70	A4	74	2C	CE	8F	85	85	63
3D	8A	4A	6E	3F	90	3C	3F	4A	A6	90	6E	9	15	22	75	31	1E	75	AA	78	2C	D0	90	86	86	63
3D	8B	4A	6E	3F	91	3C	3F	4A	A7	91	6E	9	14	22	75	33	1E	75	AA	79	2C	D2	91	87	87	64
3E	78	4B	65	40	7E	3D	40	4B	8E	7E	65	C	1C	2E	55	24	16	55	82	5E	2E	AC	7E	77	77	5E
3E	79	4B	66	40	7F	3D	40	4B	8F	7F	66	C	1C	2C	55	24	17	55	82	5E	2E	AE	7F	77	77	5E
3E	7A	4B	66	40	80	3D	40	4B	90	80	66	C	1B	2C	55	26	17	55	83	5F	2E	B0	80	78	78	5E
3E	7B	4B	67	40	81	3D	40	4B	92	81	67	B	1B	2A	5B	26	19	5B	89	63	2E	B2	81	79	79	5F
3E	7C	4B	67	40	82	3D	40	4B	93	82	67	B	1A	2A	5B	27	19	5B	89	63	2E	B4	82	7A	7A	5F
3E	7D	4B	68	40	83	3D	40	4B	94	83	68	B	1A	28	5B	27	1A	5B	8A	63	2E	B6	83	7B	7B	5F
3E	7E	4B	68	40	84	3D	40	4B	96	84	68	B	19	28	60	29	1A	60	90	68	2E	B8	84	7C	7C	60
3E	7F	4B	69	40	85	3D	40	4B	97	85	69	B	19	26	60	29	1B	60	90	68	2E	BA	85	7D	7D	60
3E	80	4B	69	40	86	3D	40	4B	98	86	69	B	18	26	60	2A	1B	60	91	68	2E	BC	86	7D	7D	60
3E	81	4B	6A	40	87	3D	40	4B	9A	87	6A	A	18	25	65	2A	1C	65	97	6C	2E	BE	87	7E	7E	61
3E	82	4B	6A	40	88	3D	40	4B	9B	88	6A	A	17	25	65	2C	1C	65	97	6C	2E	C0	88	7F	7F	61
3E	83	4B	6B	40	89	3D	40	4B	9C	89	6B	A	17	24	65	2C	1D	65	97	6D	2E	C2	89	80	80	61
3E	84	4B	6B	40	8A	3D	40	4B	9E	8A	6B	A	17	24	6B	2D	1D	6B	9E	71	2E	C4	8A	81	81	61
3E	85	4B	6C	40	8B	3D	40	4B	9F	8B	6C	A	17	22	6B	2D	1E	6B	9E	71	2E	C6	8B	82	82	62
3E	86	4B	6C	40	8C	3D	40	4B	A0	8C	6C	A	16	22	6B	2F	1E	6B	9E	71	2E	C8	8C	82	82	62
3E	87	4B	6C	40	8D	3D	40	4B	A2	8D	6C	9	15	22	70	30	1E	70	A5	76	2E	CA	8D	83	83	62
3E	88	4B	6D	40	8E	3D	40	4B	A3	8E	6D	9	15	21	70	30	1F	70	A5	76	2E	CC	8E	84	84	63
3E	89	4B	6D	40	8F	3D	40	4B	A4	8F	6D	9	15	21	70	31	1F	70	A5	76	2E	CE	8F	85	85	63
3E	8A	4B	6E	40	90	3D	40	4B	A6	90	6E	9	15	20	75	31	20	75	AC	7A	2E	D0	90	86	86	63
3E	8B	4B	6E	40	91	3D	40	4B	A7	91	6E	9	14	20	75	33	20	75	AC	7A	2E	D2	91	87	87	64
3F	78	4B	65	41	7E	3E	41	4B	8E	7E	65	C	1A	2E	55	28	16	55	84	60	30	AC	7E	77	77	5E
3F	79	4B	66	41	7F	3E	41	4B	8F	7F	66	C	1A	2C	55	28	17	55	84	60	30	AE	7F	77	77	5E
3F	7A	4B	66	41	80	3E	41	4B	90	80	66	C	19	2C	55	2A	17	55	84	60	30	B0	80	78	78	5E
3F	7B	4B	67	41	81	3E	41	4B	92	81	67	B	19	2A	5B	2A	19	5B	8B	64	30	B2	81	79	79	5F
3F	7C	4B	67	41	82	3E	41	4B	93	82	67	B	18	2A	5B	2B	19	5B	8B	65	30	B4	82	7A	7A	5F
3F	7D	4B	68	41	83	3E	41	4B	94	83	68	B	18	28	5B	2B	1A	5B	8B	65	30	B6	83	7B	7B	5F
3F	7E	4B	68	41	84	3E	41	4B	96	84	68	B	17	28	60	2D	1A	60	92	69	30	B8	84	7C	7C	60
3F	7F	4B	69	41	85	3E	41	4B	97	85	69	B	17	26	60	2D	1B	60	92	69	30	BA	85	7D	7D	60
3F	80	4B	69	41	86	3E	41	4B	98	86	69	B	16	26	60	2E	1B	60	92	6A	30	BC	86	7D	7D	60
3F	81	4B	6A	41	87	3E	41	4B	9A	87	6A	A	16	25	65	2E	1C	65	99	6E	30	BE	87	7E	7E	61
3F	82	4B	6A	41	88	3E	41	4B	9B	88	6A	A	15	25	65	30	1C	65	99	6E	30	C0	88	7F	7F	61
3F	83	4B	6B	41	89	3E	41	4B	9C	89	6B	A	15	24	65	30	1D	65	99	6E	30	C2	89	80	80	61
3F	84	4B	6B	41	8A	3E	41	4B	9E	8A	6B	A	15	24	6B	32	1D	6B	A0	73	30	C4	8A	81	81	61
3F	85	4B	6C	41	8B	3E	41	4B	9F	8B	6C	A	15	22	6B	32	1E	6B	A0	73	30	C6	8B	82	82	62

```
Rc14 Bc14 adr98 99 9A 9B A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB B0 B8 L  BD BE BF C0 C1 C2

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 3F 87        4B 6C 41 8D 3E 41 4B A2 8D 6C  9 13 22 70 35 1E 70 A7 77 30 CA 8D 83 83 62
 3F 88        4B 6D 41 8E 3E 41 4B A3 8E 6D  9 13 21 70 35 1F 70 A7 78 30 CC 8E 84 84 63
 3F 89        4B 6D 41 8F 3E 41 4B A4 8F 6D  9 13 21 70 36 1F 70 A7 78 30 CE 8F 85 85 63
 3F 8A        4B 6E 41 90 3E 41 4B A6 90 6E  9 13 20 75 36 20 75 AE 7C 30 D0 90 86 86 63
 3F 8B        4B 6E 41 91 3E 41 4B A7 91 6E  9 12 20 75 38 20 75 AE 7C 30 D2 91 87 87 64
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 40 79        4C 66 42 7F 3F 42 4C 8F 7F 66  C 1A 29 55 28 19 55 85 61 31 AE 7F 77 77 5E
 40 7A        4C 66 42 80 3F 42 4C 90 80 66  C 19 29 55 2A 19 55 85 61 31 B0 80 78 78 5E
 40 7B        4C 67 42 81 3F 42 4C 92 81 67  B 19 27 5B 2A 1A 5B 8C 66 31 B2 81 79 79 5F
 40 7C        4C 67 42 82 3F 42 4C 93 82 67  B 18 27 5B 2B 1A 5B 8C 66 31 B4 82 7A 7A 5F
 40 7D        4C 68 42 83 3F 42 4C 94 83 68  B 18 25 5B 2B 1B 5B 8C 66 31 B6 83 7B 7B 5F
 40 7E        4C 68 42 84 3F 42 4C 96 84 68  B 17 25 60 2D 1B 60 93 6B 31 B8 84 7C 7C 60
 40 7F        4C 69 42 85 3F 42 4C 97 85 69  B 17 24 60 2D 1D 60 93 6B 31 BA 85 7D 7D 60
 40 80        4C 69 42 86 3F 42 4C 98 86 69  B 16 24 60 2E 1D 60 94 6B 31 BC 86 7D 7D 60
 40 81        4C 6A 42 87 3F 42 4C 9A 87 6A  A 16 22 65 2E 1E 65 9A 6F 31 BE 87 7E 7E 61
 40 82        4C 6A 42 88 3F 42 4C 9B 88 6A  A 15 22 65 30 1E 65 9A 70 31 C0 88 7F 7F 61
 40 83        4C 6B 42 89 3F 42 4C 9C 89 6B  A 15 21 65 30 1F 65 9B 70 31 C2 89 80 80 61
 40 84        4C 6B 42 8A 3F 42 4C 9E 8A 6B  A 15 21 6B 32 1F 6B A1 74 31 C4 8A 81 81 61
 40 85        4C 6C 42 8B 3F 42 4C 9F 8B 6C  A 15 20 6B 32 20 6B A1 74 31 C6 8B 82 82 62
 40 86        4C 6C 42 8C 3F 42 4C A0 8C 6C  A 14 20 6B 33 20 6B A2 75 31 C8 8C 82 82 62
 40 87        4C 6C 42 8D 3F 42 4C A2 8D 6C  9 13 20 70 35 20 70 A8 79 31 CA 8D 83 83 62
 40 88        4C 6D 42 8E 3F 42 4C A3 8E 6D  9 13 1F 70 35 21 70 A9 79 31 CC 8E 84 84 63
 40 89        4C 6D 42 8F 3F 42 4C A4 8F 6D  9 13 1F 70 36 21 70 A9 7A 31 CE 8F 85 85 63
 40 8A        4C 6E 42 90 3F 42 4C A6 90 6E  9 13 1E 75 36 22 75 AF 7E 31 D0 90 86 86 63
 40 8B        4C 6E 42 91 3F 42 4C A7 91 6E  9 12 1E 75 38 22 75 B0 7E 31 D2 91 87 87 64
 41 78        4C 65 43 7E 40 43 4C 8E 7E 65  C 17 2B 55 2C 18 55 86 62 33 AC 7E 77 77 5E
 41 79        4C 66 43 7F 40 43 4C 8F 7F 66  C 17 29 55 2C 19 55 86 62 33 AE 7F 77 77 5E
 41 7A        4C 66 43 80 40 43 4C 90 80 66  C 16 29 55 2E 19 55 87 63 33 B0 80 78 78 5E
 41 7B        4C 67 43 81 40 43 4C 92 81 67  B 16 27 5B 2E 1A 5B 8D 67 33 B2 81 79 79 5F
 41 7C        4C 67 43 82 40 43 4C 93 82 67  B 15 27 5B 30 1A 5B 8E 67 33 B4 82 7A 7A 5F
 41 7D        4C 68 43 83 40 43 4C 94 83 68  B 15 25 5B 30 1B 5B 8E 68 33 B6 83 7B 7B 5F
 41 7E        4C 68 43 84 40 43 4C 96 84 68  B 15 25 60 32 1B 60 95 6C 33 B8 84 7C 7C 60
 41 7F        4C 69 43 85 40 43 4C 97 85 69  B 15 24 60 32 1D 60 95 6C 33 BA 85 7D 7D 60
 41 80        4C 69 43 86 40 43 4C 98 86 69  B 14 24 60 34 1D 60 95 6D 33 BC 86 7D 7D 60
 41 81        4C 6A 43 87 40 43 4C 9A 87 6A  A 14 22 65 34 1E 65 9C 71 33 BE 87 7E 7E 61
 41 82        4C 6A 43 88 40 43 4C 9B 88 6A  A 13 22 65 35 1E 65 9C 71 33 C0 88 7F 7F 61
 41 83        4C 6B 43 89 40 43 4C 9C 89 6B  A 13 21 65 35 1F 65 9C 71 33 C2 89 80 80 61
 41 84        4C 6B 43 8A 40 43 4C 9E 8A 6B  A 13 21 6B 37 1F 6B A3 76 33 C4 8A 81 81 61
 41 85        4C 6C 43 8B 40 43 4C 9F 8B 6C  A 13 20 6B 37 20 6B A3 76 33 C6 8B 82 82 62
 41 86        4C 6C 43 8C 40 43 4C A0 8C 6C  A 12 20 6B 39 20 6B A3 76 33 C8 8C 82 82 62
 41 87        4C 6C 43 8D 40 43 4C A2 8D 6C  9 11 20 70 3B 20 70 AA 7B 33 CA 8D 83 83 62
 41 88        4C 6D 43 8E 40 43 4C A3 8E 6D  9 11 1F 70 3B 21 70 AA 7B 33 CC 8E 84 84 63
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 41 8A        4C 6E 43 90 40 43 4C A6 90 6E  9 11 1E 75 3C 22 75 B1 80 33 D0 90 86 86 63
 41 8B        4C 6E 43 91 40 43 4C A7 91 6E  9 10 1E 75 3E 22 75 B1 80 33 D2 91 87 87 64
 42 78        4D 65 44 7E 41 44 4D 8E 7E 65  C 17 28 55 2C 1A 55 88 64 35 AC 7E 77 77 5E
 42 79        4D 66 44 7F 41 44 4D 8F 7F 66  C 17 26 55 2C 1B 55 88 64 35 AE 7F 77 77 5E
 42 7A        4D 66 44 80 41 44 4D 90 80 66  C 16 26 55 2E 1B 55 88 64 35 B0 80 78 78 5E
 42 7B        4D 67 44 81 41 44 4D 92 81 67  B 16 24 5B 2E 1C 5B 8F 69 35 B2 81 79 79 5F
 42 7C        4D 67 44 82 41 44 4D 93 82 67  B 15 24 5B 30 1C 5B 8F 69 35 B4 82 7A 7A 5F
 42 7D        4D 68 44 83 41 44 4D 94 83 68  B 15 23 5B 30 1E 5B 8F 69 35 B6 83 7B 7B 5F
 42 7E        4D 68 44 84 41 44 4D 96 84 68  B 15 23 60 32 1E 60 96 6E 35 B8 84 7C 7C 60
 42 7F        4D 69 44 85 41 44 4D 97 85 69  B 15 21 60 32 1F 60 96 6E 35 BA 85 7D 7D 60
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Rc14;Bc14 adr98 99 9A 9B A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB B0 B8 B9 BD BE BF C0 C1 C2

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 42 81        4D 6A 44 87 41 44 4D 9A 87 6A  A 14 20 65 34 20 65 9D 73 35 BE 87 7E 7E 61
 42 82        4D 6A 44 88 41 44 4D 9B 88 6A  A 13 20 65 35 20 65 9E 73 35 C0 88 7F 7F 61
 42 83        4D 6B 44 89 41 44 4D 9C 89 6B  A 13 1F 65 35 21 65 9E 73 35 C2 89 80 80 61
 42 84        4D 6B 44 8A 41 44 4D 9E 8A 6B  A 13 1F 6B 37 21 6B A5 78 35 C4 8A 81 81 61
 42 85        4D 6C 44 8B 41 44 4D 9F 8B 6C  A 13 1E 6B 37 22 6B A5 78 35 C6 8B 82 82 62
 42 86        4D 6C 44 8C 41 44 4D A0 8C 6C  A 12 1E 6B 39 22 6B A5 78 35 C8 8C 82 82 62
 42 87        4D 6C 44 8D 41 44 4D A2 8D 6C  9 11 1E 70 3B 22 70 AC 7D 35 CA 8D 83 83 62
 42 88        4D 6D 44 8E 41 44 4D A3 8E 6D  9 11 1D 70 3B 24 70 AC 7D 35 CC 8E 84 84 63
 42 89        4D 6D 44 8F 41 44 4D A4 8F 6D  9 11 1D 70 3C 24 70 AC 7D 35 CE 8F 85 85 63
 42 8A        4D 6E 44 90 41 44 4D A6 90 6E  9 11 1C 75 3C 25 75 B3 82 35 D0 90 86 86 63
 42 8B        4D 6E 44 91 41 44 4D A7 91 6E  9 10 1C 75 3E 25 75 B3 82 35 D2 91 87 87 64
 43 78        4E 65 45 7E 42 45 4E 8E 7E 65  C 17 25 55 2C 1C 55 89 65 36 AC 7E 77 77 5E
 43 79        4E 66 45 7F 42 45 4E 8F 7F 66  C 17 23 55 2C 1D 55 89 65 36 AE 7F 77 77 5E
 43 7A        4E 66 45 80 42 45 4E 90 80 66  C 16 23 55 2E 1D 55 89 65 36 B0 80 78 78 5E
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 43 7E        4E 68 45 84 42 45 4E 96 84 68  B 15 20 60 32 20 60 98 6F 36 B8 84 7C 7C 60
 43 7F        4E 69 45 85 42 45 4E 97 85 69  B 15 1F 60 32 21 60 98 6F 36 BA 85 7D 7D 60
 43 80        4E 69 45 86 42 45 4E 98 86 69  B 14 1F 60 34 21 60 98 70 36 BC 86 7D 7D 60
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 43 82        4E 6A 45 88 42 45 4E 9B 88 6A  A 13 1E 65 35 23 65 9F 74 36 C0 88 7F 7F 61
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 43 86        4E 6C 45 8C 42 45 4E A0 8C 6C  A 12 1B 6B 39 25 6B A7 7A 36 C8 8C 82 82 62
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 44 78        4E 65 46 7E 44 46 4E 8E 7E 65  8 14 25 80 32 1C 80 C0 8A 38 AC 7E 77 77 5E
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 44 81        4E 6A 46 87 44 46 4E 9A 87 6A  7 12 1E 98 3A 23 98 E0 A0 38 BE 87 7E 7E 61
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 44 84        4E 6B 46 8A 44 46 4E 9E 8A 6B  6 11 1C A0 3E 24 A0 EB A7 38 C4 8A 81 81 61
 44 85        4E 6C 46 8B 44 46 4E 9F 8B 6C  6 11 1B A0 3E 25 A0 EB A7 38 C6 8B 82 82 62
 44 86        4E 6C 46 8C 44 46 4E A0 8C 6C  6 10 1B A0 40 25 A0 EB A8 38 C8 8C 82 82 62
 44 87        4E 6C 46 8D 44 46 4E A2 8D 6C  6 10 1B A8 42 25 A8 F5 AE 38 CA 8D 83 83 62
 44 88        4E 6D 46 8E 44 46 4E A3 8E 6D  6 10 1A A8 42 27 A8 F6 AF 38 CC 8E 84 84 63
 44 89        4E 6D 46 8F 44 46 4E A4 8F 6D  6  F 1A A8 44 27 A8 F6 AF 38 CE 8F 85 85 63
 44 8A        4E 6E 46 90 44 46 4E A6 90 6E  6  F 1A B0 44 28 B0 100 B6 38 D0 90 86 86 63
 44 8B        4E 6E 46 91 44 46 4E A7 91 6E  6  F 1A B0 46 28 B0 100 B6 38 D2 91 87 87 64
```

3-3-24. Outdoor White Balance Check

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Specified value	Refer to Fig 3-34.

[Check Method]

1) Press the White Balance button to select the outdoor white balance mode. (A mark "☼" appears on the EVF screen or monitor screen (when the data screen is turned on)).
2) Check that the center of the white bright point is within the circumference shown in Fig. 3-34.

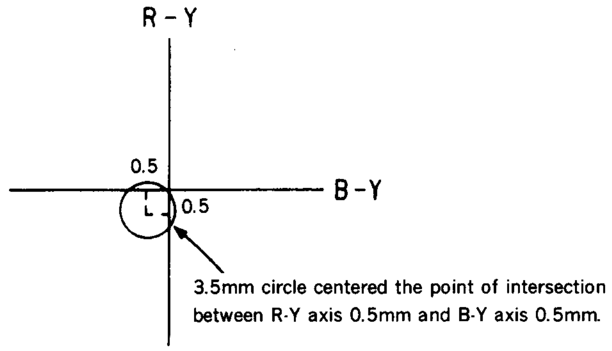

R-Y
0.5
B-Y
L
0.5
3.5mm circle centered the point of intersection between R-Y axis 0.5mm and B-Y axis 0.5mm.

Fig. 3-34.

3-3-25. Focus Motor Speed Adjustment (AF-54P Board)

Object	Optional
Measurement point	Focus ring
Measuring instrument	Stopwatch
Adjustment page	F
Adjustment address	30 (LOW F SPEED)
Specified value	2.5±0.1 second

Reference: A rotation time is about 2.5 seconds from the focusing ring short distance end to long distance end after completing adjustment.

[Adjustment Method]

1) Press the FOCUS button (CK-40P board S671) to turn on auto focus.
2) Select the adjustment address EB with the adjustment remote control and enter adjustment data 01. (setting of the hunting mode)
3) Set the adjustment address to 30.
4) A rotation time is about 2.5 seconds from the focusing ring short distance end to long distance end.
5) Repeat the step 4) 10 times and obtain an average value. Specified value=2.5±0.1 second. When the specified value is not met, repeat the step and 4).
6) Set the adjustment address to EB and the adjustment data to 00. (cancellation of the hunting mode)
7) Change the adjustment address in order to store the adjustment data.

3-3-26. Macro Area Adjustment (AF-54P Board)

Object	Optional
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig (AF jig)
Adjustment page	F
Adjustment address	37 (ZOOM-POSI 4)
Specified value	AF microcomputer data reader jig data : H+4

[Adjustment Method]

1) Set the zoom ring at the WIDE end.
2) Select the adjustment page F with the adjustment remote control.
3) Select the adjustment address EB with the adjustment remote control and set the adjustment data to C3.
4) Set the adjustment address 37 with the adjustment remote control, an note down the data of the AF jig. (This data is H.)
5) Input the value of (H+4) to the adjustment data.
6) Change the adjustment address to EB and set the adjustment data to 00.
7) Change the adjustment address in order to store the adjustment data.
   (Example)
   AF microcomputer data jig   Input value
   07 ——→ 0B
   06 ——→ 0A
   ⋮   ⋮

3-3-27. Auto Focus Adjustment

(1) Preparation for AF Data Entry (AF-54P Board)

Object	All black (Cover the lens with a black cap), all white pattern
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig (AF jig)
Adjustment page	F
Adjustment address	2B (FH BM) 29 (FA BM) 46 (AGC B) 2A (FH WM) 45 (AGC W)
Specified value	FH WM≦28

[Adjustment Method]

1) Turn off auto focus with the FOCUS button (CK-40P board S671).
2) Cover the lens with a black cap.
3) Select the adjustment page F with the adjustment remote control.
4) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
5) Read the AF microcomputer data reader jig add +3 and enter this data (FH BM) to the adjustment address 2B.
6) Select the adjustment address EB and set the adjustment data to EF.
7) Read the AF microcomputer data reader jig add +3 and enter this data (FA BM) to the adjustment address 29.
8) Select the adjustment address EB and set the adjustment data 0B.
9) Read the AF microcomputer data reader jig and enter this data (AGC B) to the adjustment address 46.
10) Remove the black cap from the lens and pick up an image with a white pattern (pattern box).
    (When this is done, check that the white diffusion plate for the pattern box is not dirty.)
11) Select the adjustment address EB and set the adjustment data to ED.
12) Read the AF microcomputer data reader jig and enter this data (FH WM) to the adjustment address 2A. (FH WM≦28)
13) Select the adjustment address EB and set the adjustment data to 0B.
14) Read the AF microcomputer data reader jig and enter this data (AGC W) to the adjustment address 45.
15) Select the adjustment address EB and set the adjustment data to 00.
16) Change the adjustment address in order to store the adjustment data.

(2) Auto Focus Check (AF-54P Board)

Object	Siemens star (1.5m in front of the lens datum level (marked by "ϕ"))
Filter	ND filter 1.0×1 pcs., 0.1×2 pcs.
Measurement point	Focus ring
Measuring instrument	
Specified values	The focus ring stops at 2 to 3 of the index.

[Measurement method]

1) Place a Siemens star at 1.5m from the lens standard surface (See to Fig. 3-2)
2) Set the zoom lever to the TELE end (68mm) and turn off the auto focus with the FOCUS button (CK-40P board S671).

3) Adjust the camera position so that the center of the Siemens star on the monitor is correspond to the center of the screen.
4) Cover the lens with the ND filter 1.2.
5) Set the focus ring at short range end (1.1m). Make a picture of the Siemens star in the standard frame and turn on the auto focus with the FOCUS button.
6) After 2.0 seconds, confirm that the picture of Siemens star is taken clearly. Turn off the auto focus with the focus button.

Note : In the case of New microcomputer (after MC68HC11E9-SC400188), perform the following adjustment method.

1) Cover the lens with black cap and make all black.
2) Set the zoom lever to the WIDE end, and turn off the auto focus with the focus button.
3) Set the focus ring to ∞ and turn on the auto focus.
4) Confirm that the focus ring stops within the range of index 2 to 3.

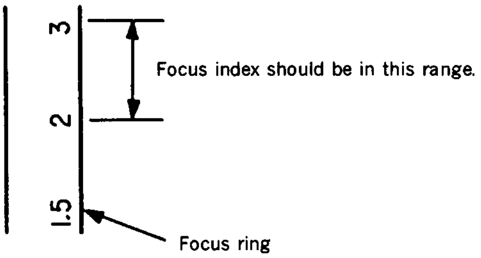


Fig. 3-35

3-3-28. Auto Focus Measuring distance Check

Object	Siemens star (at a distance of 1.5m in front of the lens datum level (marked by "ϕ"))

Note 1 : Connect the EVF (Electronic View Finder) to make adjustment.

[Measurement Methed]

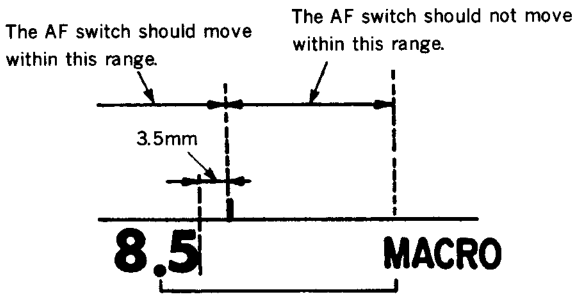
1) Place the Siemens star at a distance of 1.5m in front of the lens datum level (refer to Fig.3-2).
2) Cover the ND filter 1.2.
3) Shift the zoom lever to the TELE end (68mm).
4) Adjust a camera block position to center the Siemens star on the monitor screen with the monitor screen.
5) Turn off auto focus with the FOCUS button (CK-40P board S671).
6) Turn the focusing ring as far as the short distance end (1.1m).
7) Press the PUSH AUTO button (CK-40P board S673).
8) After 2 seconds, check that a clear image can be obtained.
9) Turn off auto focus and turn the focusing ring as far as the long distance end (∞).
10) Press the PUSH AUTO button.
11) After 3 seconds, check that a clear image can be obtained.

3-3-29. AF-Zooming Check

Object	All white pattern
Measurement point	Lens focusing ring or zoom ring
Specified value	Refer Fig. 3-36.

[Checking Method]

1) Obtain a picture of all white pattern by the WIDE end. And check that turning off and on the auto focus with the FOCUS switch (CK-40P board S671) permits the operation of both ends of the short distance end (1.1m) and the long distance end (on) over one operation.
2) After setting the Zoom lever in the MACRO range as shown in the figure, check that the focus ring does not move when the focus switch is turned ON and OFF, and turned ON again.


The AF switch should move within this range.
The AF switch should not move within this range.
3.5mm
8.5
MACRO

(After pushing fully the zoom lever to the MACRO point, put it back to the position in the figure.)

Fig. 3-36.

3-4. DIGITAL TITLER SYSTEM ADJUSTMENT

3-4-1. Chroma Phase/Gain Adjustment (CT-21P Board)

Mode	CAMERA Standby
Object	All Black (Cover the lens with a black cap.)
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment element	RV702
Specified value	Adjust Mg (Magenta) to the specified range. (Check that other colors are also in the specified range.)

[Measurement Method]

1) Press the SUPERIMPOSE button (DK-6P board S950).
2) Press the COLOR/MODE button (DK-6P board S951) and select Mg(Magenta).
3) Cover the lens with black cap.
4) Press MEMORY button (DK-6P board S953) and display the all title.
5) At this time, the specified value should be satisfied.
6) After the adjustment, make R (red), Y_L (yellow), G (green), Cy (Cyan), B (blue), and check that the specified balue is satisfied.

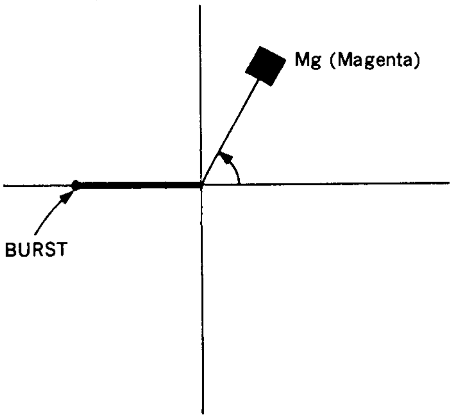


Fig. 3-37.

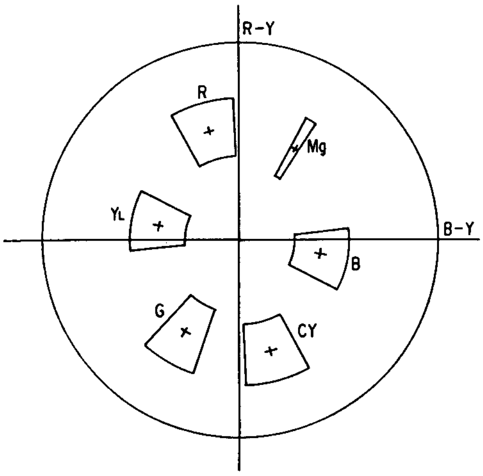


Fig. 3-38.

3-4-2. Fader Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap)
Measurement point	Checkpoint array Ⓐ8 pin (CAM Y) or CN307 pin ① (Y OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1D (FADER LEVEL) 1F (FADER CONT)
Specified value	240±5mVp-p

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 1F with the adjustment remote control and pre-set the adjustment data to FF.
3) Set the adjustment address to 1D with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the fader level to 240±5mVp-p.
5) Select the adjustment address 1F with the adjustment remote control and set the adjustment data to 00.
6) Change the adjustment address in order to store the adjustment data.

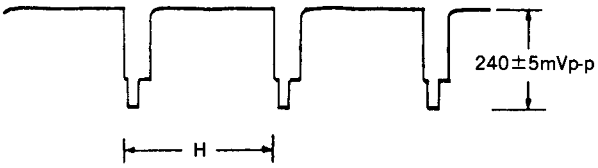
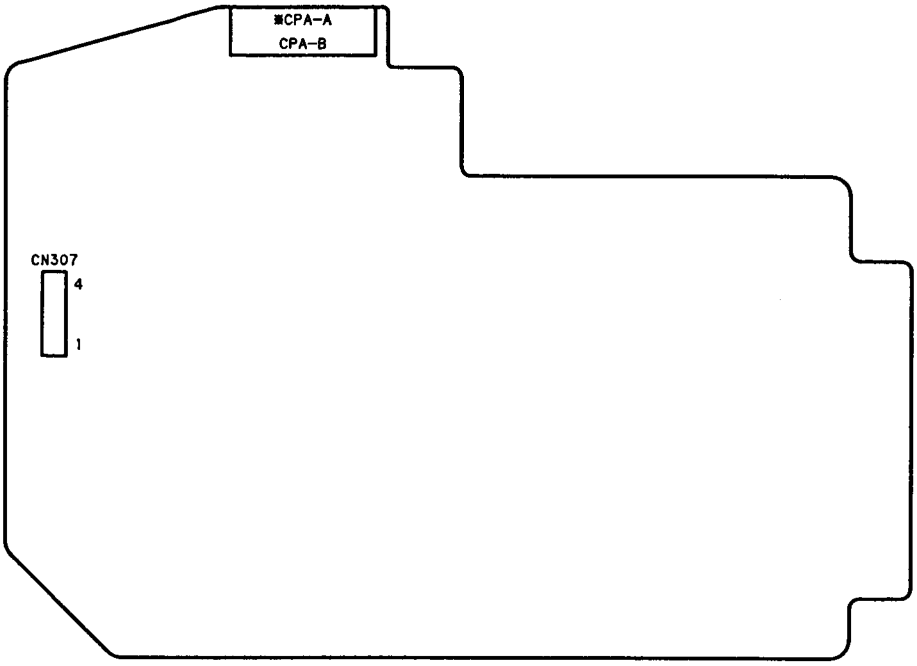


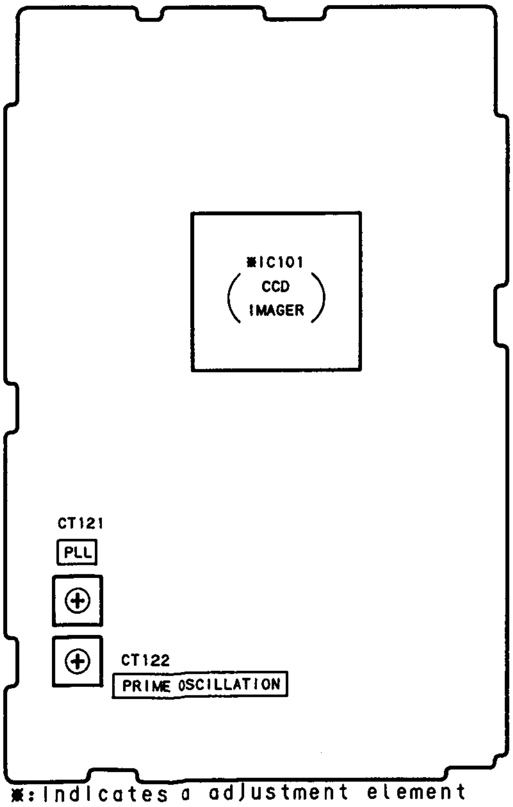
Fig. 3-39.

3-5. ADJUSTING PART LOCATION DIAGRAM

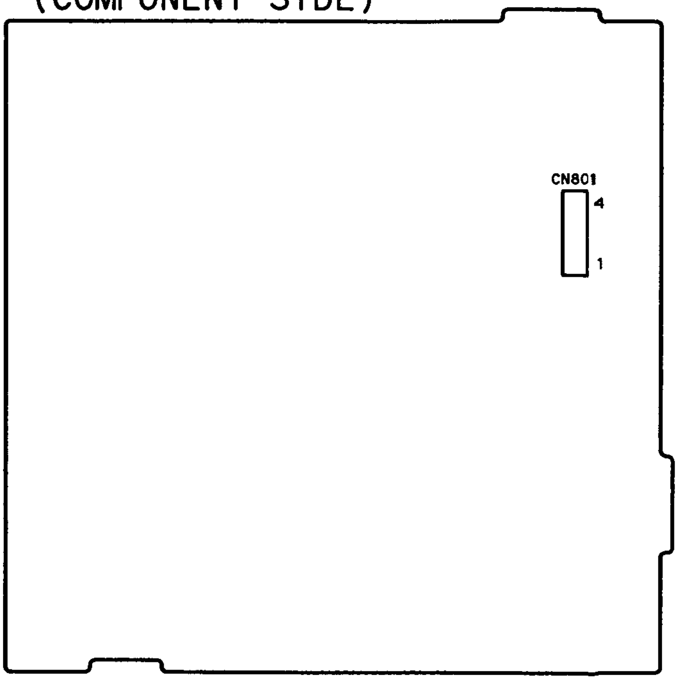
VC-67P BOARD
(CONDUCTOR SIDE)


*CPA-A
CPA-B
CN307
4
1

CD-20P BOARD
(COMPONENT SIDE)


*IC101
(CCD
IMAGER)
CT121
PLL
CT122
PRIME OSCILLATION

AF-54P BOARD
(COMPONENT SIDE)



*: Indicates a adjustment element
mounted on the conductor side.

SECTION 4
ELECTRICAL ADJUSTMENT (VIDEO SYSTEM)

See the adjusting part location diagram from on page 78 for the adjustment.

4-1. PREPARATION FOR ADJUSTMENT

4-1-1. Equipment Required

The following measuring instruments are needed in adjusting the VTR section.

1) Monitor TV
2) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10 : 1, unless otherwise specified.)
3) Frequency counter
4) Pattern generator (with video output terminal)
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tape
    For tracking adjustment (WR5-1CP)*[1]
        Part number : 8-967-995-07
    For video frequency characteristics adjustment (WR5-6C)*[2]
        Part number : 8-967-995-17
    For operation check (WR5-4CL)*[3]
        Part number : 8-967-995-56
    For operation check (WR5-5CSP)*[4]
        Part number : 8-967-995-47

Note : * 1 : WR5-1C(8-967-995-06)
* 2 : WR5-2C (8-967-995-16)
* 3 : WR5-3CL (8-967-995-36)
* 4 : WR5-3CSP(8-967-995-27)
WR5-4CSP (8-967-995-46)

You can use these tape.

12) Adjustment remote control (RM-95 Partially remodeled product)

4-1-2. Precaution for Adjustment

The video section can be also adjusted without the camera section. Remove the camera section by disconnecting the following 5 connectors.

1. VC-67P board CN305
2. DC-DC converter 3P connecter (connect the FU-72P board W991)
3. VC-67P board CN307
4. VC-67P board CN306
5. SS-100P board CN503

Remove the EVF section by disconnecting the following connector.

1. VA-46P board CN601

MIC board (MC-44P board) is not necessary for video section adjustment. Remove the MIC board by disconnecting the following connector.

1. VA-46P board CN401

4-1-3. Equipment Connection

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

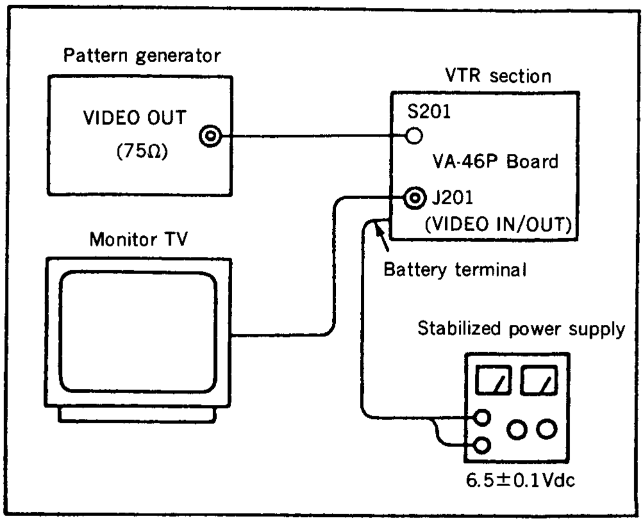


Fig. 4-1.

4-1-4. Setting up for Adjustment

Video signals output from a pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard. Connect an oscilloscope to J201 (VIDEO IN/OUT) on theVA-46P board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and of burst signals are flat at approximately 0.3, 0.7, and 0.3V respectively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 4-2 shows video signals (color burst) used in the video section adjustments.

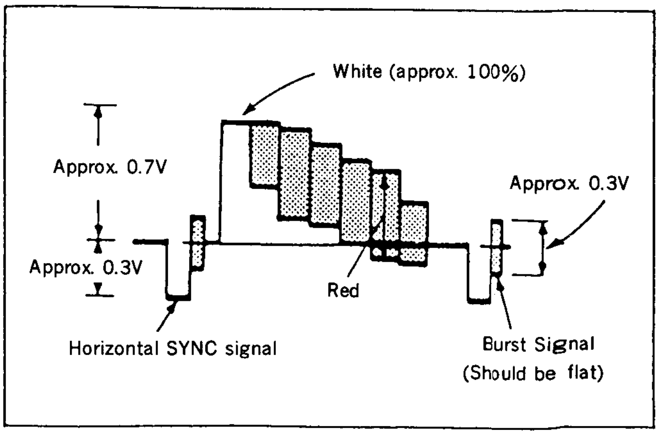
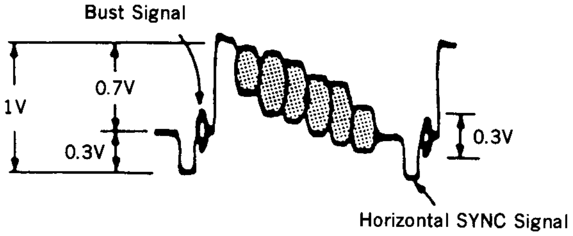
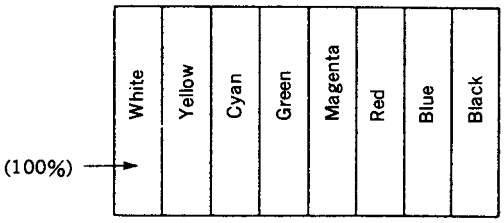


Fig. 4-2.

4-1-5. Alignment tape

Tape	Description	Use for
Tracking (WR5-ICP)	1. Recording area PCM—Video 2. Recording content : CH2 : 1MHz linearity adjustment signal (CH1 : 9MHz)	Drum linearity adjustment
Video frequency characteristic (WR5-6C)	1. Recording area Video 2. Recording content RF sweep 0 to 10MHz 3. Marker 1, 3.58, 5.5 and 7MHz	Frequency characteristic adjustment
Operation cheking SP mode (WR5-5CSP) LP mode (WR5-4CL) Note : PCM area is not included in WR5-4CL	1. Recording area Video 2. Recording content ■ Video area ● Video signals Color bar : 4min. Monoscope : 4min. (Color bars)  Bust Signal 1V 0.7V 0.3V 0.3V Horizontal SYNC Signal  White Yellow Cyan Green Magenta Red Blue Black (100%) ● Audio signal (AFM) 400Hz, 60% modulation ■ PCM track (WR5-5CSP only) ● Audio signal (PCM) 1kHz, ...4 min. (color bar section) 20Hz, ...20 sec. 400Hz, ...20 sec. } Iterative 14kHz. . . . . .20 sec.	Operation checking

4-1-6. Input/Output Level and impedance

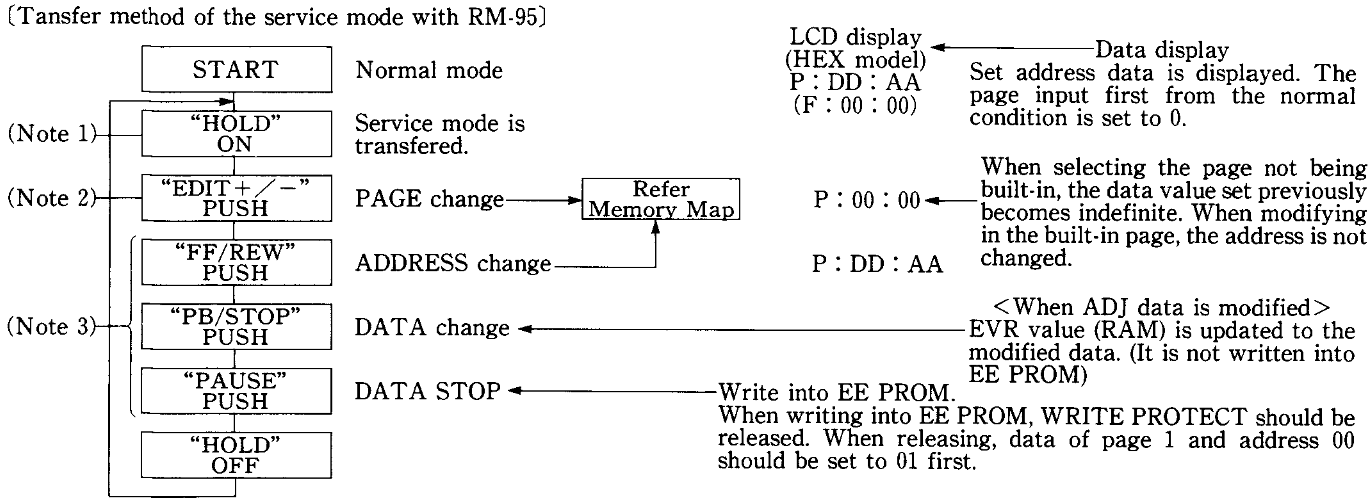
Video input/output Phono jack
Output signal : 1Vp-p, 75Ω unbalance, sync negative

Audio input/output Phono jack
Specified output : −10dBs (47Ω at load)
Impedance : 2.2kΩ or less

(AEP/UK Model → Output only
E/Australian Model → Input/output)

4-1-7. Service Mode

〔Tansfer method of the service mode with RM-95〕


START
"HOLD" ON
"EDIT+/−" PUSH
"FF/REW" PUSH
"PB/STOP" PUSH
"PAUSE" PUSH
"HOLD" OFF
(Note 1)
(Note 2)
(Note 3)
Normal mode
PAGE change
ADDRESS change
Refer Memory Map
DATA change
DATA STOP
LCD display (HEX model)
P : DD : AA
(F : 00 : 00)
Data display
P : 00 : 00
P : DD : AA

Service mode is transfered.

Set address data is displayed. The page input first from the normal condition is set to 0.

When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM. RAM	Pause

[ADJUST, TEST MODE description]

MODE		PAGE/DATA/ADDRESS	Contents
ADJUST	Switching Position Adjustment	D : -- : 04 (high) D : -- : 05 (low)	Switching position adjustment See to page 61 for details
	Battery Down Adjustment	D : -- : 06 (Sensor value) D : -- : 07 (Set value)	Use for battery down adjustment See to page 60 for details
TEST MODE	Pass Adjustment Truck Shift	1 : 30 : 4D	Truck shift for pass adjustment Set to the data described left and set the playback mode.
	Emergency Inhibit	1 : 10 : 4D	Detection of emergency is inhibited. Even if battery is ended, power is not turned off. SP/LP is not automatically distinguished. Emergency detection except for TAPE/TOP•END is inhibited.
	Emergency Code	D : -- : 20~22 D : -- : 24~26	First emergency is displayed. Last emergency is displayed. (※ See to 1) (IC501 μPD75312GF-018 and 024 are not displayed.)
	RECOG SW Check	1 : -- : 3D 1 : -- : 3E	Mode switch position is displayed. RECOG SW ON OFF is displayed. (※ See to 2)
	Function SW Check	1 : -- : E8~ED	Pressing KEY is checked. (※ See to 3)
	Motor single check	3 : 10 : DD (Loading Ⓜ) 3 : 11 : DD (Drum Ⓜ) 3 : 12 : DD (Capstan Ⓜ)	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Loading Motor • Drum Motor (※ See to 4) • Capstan Motor

MODE		PAGE/DATA/ADDRESS	Contents
TEST MODE	Sensor check	3 : 21 : DD	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction DEW sensor. (※ See to 5)
	Reception contents check of wireless remote control	1 : -- : 1E and 1D	The received code contents of the remote control code can be confirmed. (※ See to 6)

※1 **Emergency Code Check**
With the SENSER LANC

(The emergency code has the first emergency and last emergency. The last emergency side is changed when emergency is generated ; the first emergency side records the only code generated first.)

			First	Last	
PAGE	D	ADDRESS	20, 21	24, 25	← Emergency code
PAGE	D	ADDRESS	22	26	← Mode when emergency is generated

Displayed → Be sure to rewrite the address from 20 to 26 to data 00 after the operation.

(1) Emergency code list

Code		Emergency contents
20H,24H	21H,25H	
00	00	Normal mode
01	00	Loading Motor emergency.
02	00	Unloading, Reel emergency.
04	00	Steady, Reel emergency.
08	00	Capstan emergency.
00	01	Drum steady, FG emergency.
00	02	Drum steady, PG emergency.
00	21	Drum steady, FG emergency.
00	22	Drum steady, PG emergency.
00	41	Loading, Drum FG emergency.
00	42	Loading, Drum PG emergency.
00	81	Unloading, Drum FG emergency.
00	82	Unloading, Drum PG emergency.
——	——	Dram steady Phase emergency.

- In order to delete the contents of 〔the first and the last emergency〕, write with SENSER LANC as follows.

Page 1	Address 00	Data 01

After that, write data 00 into each address. After writing, return to

Page 1	Address 00	Data 00

(2) Mode code

Mode	Code	Mode	Code
STOP	20	EDIT S CUE	5A
FF	30	EDIT S REV	5B
REW	38	EDIT S STIL	5F
PB	60	+×1	62
CUE	64	−×1	63
REV	65	−STILL	79
STILL	70	+FRAME	76
REC	40	−FRAME	77
REC. P	41	+×2	66
SHUTTLE EDIT (+)	5A	−×2	62
SHUTTLE EDIT (−)	5B	LOADING	21
CAM STBY	41	UNLOADING	13
CAM REC	40	EJECTED	10
REC REV+	58	+SLOW	72
REC REV−	59	−SLOW	73

Note : Pay attention that the above codes are displayed in the reverse order when FU-72P board IC501 μPD75312GF-018 and 024 are mounted.
Example) PB 06

※ 2 RECOG SW Check

With the SENSER LANC

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE

"1"=REC inhibit

"1"=ME/ 0 : MP

"1"=MPHG/ 0 : Normal

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3E	DEW			RP PB MODE	CASSETTE COMPARTMENT LOCK	MODE SW2	MODE SW1	MODE SW0

See to the following list

When locking the cassette COMPARTMENT, "1"

- MODE SW CODE LIST

	Address 3E contents			Real port condition			Remark
Position	M SW2	M SW1	M SW0	M SW2	M SW1	M SW0	
EJECT	0	0	0	L	H	H	Cassette COMPARTMENT eject position
IA	0	0	1	H	H	H	Interval A
UNLOAD	0	1	0	L	L	H	Normal EJECT unloaded
IB	0	1	1	H	L	H	Interval B
STOP	1	0	0	H	L	L	STOP mode position
IC	1	0	1	H	H	L	Interval C
FWD	1	1	0	L	H	L	Pinch pressure welded
ID	1	1	1	L	L	L	Interval D
SHAKING HEAD POSITION	0	0	0	L	H	L	Shaking head ptsition

☆ This mode releasing is turn off the SENSER LANC.

※ **3 Switch check** (See to the previous page for reading code.)

With the SENSER LANC :

Page 1	Address E8 to ED	Data Refer to table

Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	K IN 7	K IN 6	K IN 5	K IN 4	K IN 3	K IN 2	K IN 1	K IN 0
E 8 K OUT 0	——	REMOTE ON/OFF	——	T1	——	MACRO AF	SHUTTER	AUTO LOCK
E 9 K OUT 1	——	——	MEMORY	COLOR	DATA SCREEN	ONE PUSH AF	AF ON/OFF	——
EA K OUT 2	——	——	EDIT (+)	EDIT (−)	FRAME	AWB	BACK LIGHT	——
EB K OUT 3	——	STANDBY	PAUSE	RESET	REC	FADER	——	——
EC K OUT 4	——	START/ STOP	PB	ZERO MEMORY	TIME	DATE	AGE	VTR
ED K OUT 5	——	Edit/ OFF	REW	STOP	EJECT	FF	SLOW	CAM

☆ This mode releasing is turn off the SENSER LANC.

- Check the initial set value in shipping after the service, because EE PROM is monuted to VTR in this unit.

D Page Initial set value in shipping (for this unit)

Address	Contents					Set value
0 0 0	Aging mode					00
0 0 1	Each flag area (destination/model /HEAD width1×2MUTE)					19
0 0 2	VTR REC key acceptance authorization					59
0 0 3						--
0 0 4	Switching position (low)					Adjustment value
0 0 5	Switching position (high)					Adjustment value
0 0 6	Battery A/D modification value					Adjustment value
0 0 7	Battery end set area					Adjustment value
0 1 0	SR data storage area	EDIT OFF	MP	HI8	LP	--
0 1 1	SR data storage area	EDIT OFF	MP	HI8	SP	--
0 1 2	SR data storage area	EDIT OFF	MP	NOR	LP	3E
0 1 3	SR data storage area	EDIT OFF	MP	NOR	SP	24
0 1 4	SR data storage area	EDIT OFF	ME	HI8	LP	--
0 1 5	SR data storage area	EDIT OFF	ME	HI8	SP	--
0 1 6	SR data storage area	EDIT OFF	ME	NOR	LP	3E
0 1 7	SR data storage area	EDIT OFF	ME	NOR	SP	24
0 1 8	Titler vertical position adjustment area JOG mode					08
0 1 9	Titler vertical position adjustment area NOR mode					06
0 1 A	Titler horizontal position adjustment area playback mode					11
0 1 B	Titler horizontal position adjustment area EE mode					11
0 1 C	When SR data storage area EDIT is ON : Hi8 mode					--
0 1 D	When SR data storage area EDIT is ON : Normal mode					24
0 1 E						--
0 1 F						--
0 2 0	First generated emergency code (low) (First emergecy)					00
0 2 1	First generated emergency code (high) (First emergency)					00
0 2 2	Mode code when emergency is generated first					00
0 2 3						00
0 2 4	Last generated emergency code (low) (Last emergency)					00
0 2 5	Last generated emergency code (high) (Last emergency)					00
0 2 6	Mode code when emergency is generated last.					00

※ 4 In order to operate the motor singly

[Operation]

Write the following number with the SENSER LANC into | Page 3 | Address DD. |

Then the check of each motor is performed.

10H → Loading motor
11H → Drum motor
12H → Capstan motor

After the set of the above data, operation is performed by pressing the following keys. (When the operation is performed with RM-95, set the HOLD switch to left and release the SENSER LANC.)

FF key → Rotating in right direction
REW key → Inverting
STOP key → Stop

Note) In this mode, operation is only performed on the normally loaded condition.

Note) The motor rotating speed is the normal rotating number. (Drum 30Hz, Capstan SP mode speed, Loading normal speed).

In order to release this mode, turn off the SENSER LANC and turn off the power.

※ 5 In order to read the A/D selecting value (Sensor check)

[Operation]

With the SENSER LANC:

Write | PAGE 3 | Address DD | Data 21 |

The following address (PAGE 3) of the A/D selecting value of each A/D port is displayed.

Address	Selecting value Contents
65	TOP sensor (light ON)
67	TOP sensor (light OFF)
64	END sensor (light ON)
66	END sensor (light OFF)
62	S-REEL FG
63	T-REEL FG
60	Thermistor (for SWP correction)
5F	DEW sensor

The voltage of A/D selecting 1 step: 4.9÷256≒19mV

※ 6 In order to check the reception contents of the wireless remote control

With SENSER LANC, the received remote control code is displayed to | PAGE 1 | Address 1E. |

The remote control code is only displayed while the code which the LANC code is shifted to right for 1 bit is pressed, and FF is displayed when the code is released.

The received category code of the remote control is displayed to the upper 4 bit of | PAGE 1 | Address 1D. |

(The description of the remote control code is omitted in this chart.)

4-2. POWER VOLTAGE CHECK (SS-100P BOARD)

Measuring instrument	Digital voltmeter
SS 4.9V check	
Measurement point	CN506 pin ①
Specified value	4.90±0.15V_{DC}
AUDIO 4.9V check	
Measurement point	CN506 pin ⑦
Specified value	4.90±0.15V_{DC}
EVF 4.9V check	
Measurement point	CN503 pin ①
Specified value	4.90±0.15V_{DC}
LM 5V check	
Measurement point	CN502 pin ⑮
Specified value	4.85±0.15V_{DC}

[Check Method]

1) Each power voltage should satisfy the specified values at normal temperature and humidity.

4-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

4-3-1. Battery Down Adjustment

Mode	CARERA REC
Signal	Unnecessary
Measurement point	Display on the adjustment remote control
Measuring instrument	Adjustment remote control
Adjustment page	D
Adjustment address	06
Specified value	d: 7d:06 (reference value) Note : Actually, exact data of 5.5V_{DC} of page D address 06 is written.

[Connection]

1) Make the set MIC board, EVF board, and CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.
3) Connect the digital voltmeter so to measure the voltage of the stabilized power supply unit connected to the battery terminal.

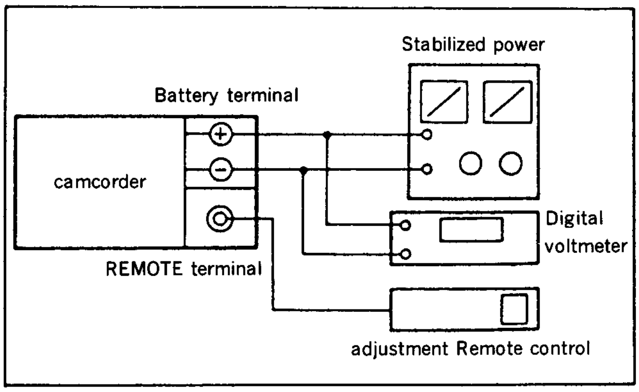
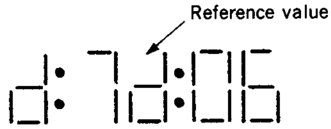


Fig. 4-3.

[Adjustment Method]

1) Turn on the POWER switch. (CAMERA mode)
2) Adjust the output of the stabilized power supply unit to be 5.58±0.01 V_{DC} (battery terminal voltage).
3) Turn on the CAMERA REC mode.
4) Set the HOLD switch of the remote control for adjustment to the HOLD side.
5) Press once the EDIT SEARCH (+) button of the adjustment commander select page 1, select data 01 of address 00, and release the protector.
6) Press four times the EDIT SEARCH (−)button of the remote control for adjusment. (Set the adjustment page to D.)
7) Be sure to set the adjustment address 06 with FF or REW button of the remote control for adjustment, and press the PAUSE button.



8) Turn off the POWER switch.

[Checking Method]

1) Turn on the power.
2) Adjust the output of the stabilized power source to be 5.66±0.01V_{DC}.
3) Set the camera REC mode.
4) After five seconds,TALLY should flash at 0.8Hz. (Battery Pre End)
5) Adjust the output of the stabilized power source to be 5.58±0.01V_{DC}.
6) Set the camera REC mode.
7) After five seconds, STOP mode should be set and TALLY should flash a 3.2Hz. (Battery END)

4-3-2. Clock Accuracy Adjustment (FU-72P Board)

Mode	E-E
Signal	Unnecessary
Measurement point	IC501 pin (69)
Measuring instrument	Ocsilloscope Freguency counter
Adjustment element	CT501
Specified value	512.000±0.001Hz

[Adjustment Method]

1) Adjust to 512.000±0.001Hz with CT501.

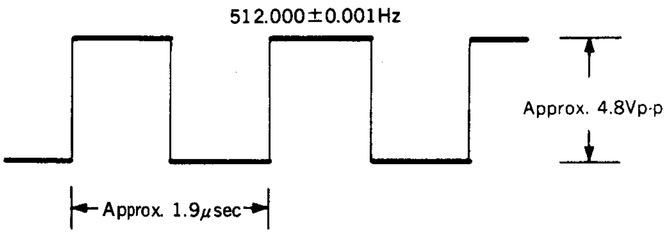


Fig. 4-4.

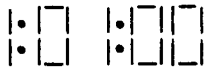
4-4. SERVO SYSTEM ADJUSTMENT

4-4-1. Switching Position Adjustment (SS-100P Board)

Mode	Playback
Signal	Alignment tape: Operation check (WR5-1CP)
Measurement point	CH1: CN508 pin ④ (SWP) CH2: CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment page	D
Adjustment address	05 04
Specified value	$t_1=0\pm5\mu$sec $t_2=0\pm5\mu$sec

[Adjustment Method]

1) Set the HOLD switch of the remote control for adjustment to the HOLD side. (ADJUST MODE is set.)
2) Select page 1 with the remote control for adjustment and select adjustment data 01 of adjustment address 00. (Protector is released.)



3) Press four times the EDIT SEARCH (—) button of the remote control for adjustment. (Adjustment page D is set.)
4) Select the adjustment address to 05 in order to change the adjustment data, and adjust to $t_1=0\pm5\mu$sec.

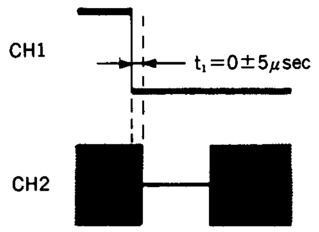


Fig. 4-5.

5) Press the PAUSE button in order to store the adjustment data.
6) Select the adjustment address 04 in order to change the adjustment data and adjust to $t_2=0\pm5\mu$sec.

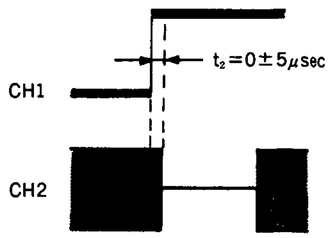


Fig. 4-6.

7) Press the PAUSE button in order to store the adjustment data.

4-4-2. Oscillation Frequency Adjustment (SS-100P Board)

Mode	Record
Signal	Unnecessary
Measurement point	Q903 collector
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	RV901
Specified value	475±5kHz

[Adjustment Method]

1) Adjust to 475±5kHz with RV901.

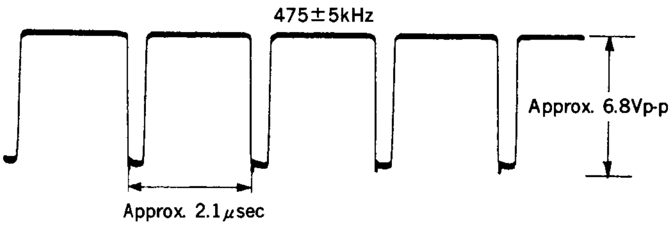


Fig. 4-7.

4-4-3. Output Voltage Adjustment (SS-100P Board)

Mode	Record
Signal	Unnecessary
Measurement point	CN507 pin ⑲
Measuring instrument	Digital voltmeter
Adjustment element	RV902
Specified value	$4.90 \pm 0.05V_{DC}$

[Adjustment Method]

1) Adjust to $4.90 \pm 0.05V_{DC}$ with RV902.

4-5. VIDEO ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure below. The color video input signal supplied from the pattern generator is used as the video input signal for video adjustment in the REC mode. Make sure that the SYNC signal and color burst signal are matched with the standard specified for set-up as shown in the Fig. 4-2 during adjustment.

[Adjustment Sequence]

1) Playback Frequency Characteristic Adjustment
2) X'tal Oscillator fo Check
3) REC E-E Level Adjustment
4) IR Adjustment
5) Chroma Comb Filter Adjustment
6) Emphasis Y Level Adjustment
7) Y FM Carrier Frequency Adjustment
8) Y FM Deviation Adjustment
9) REC Y FM Level Adjustment
10) Chroma Emphasis Adjustment
11) HUE Phase Deviation Adjustment
12) REC Chroma Level Adjustment
13) PB CCD Level Adjustment
14) PB Level Adjustment
15) 4FSC Frequency Adjustment
16) Controller Frequency Adjustment
17) Tracking TH Adjustment
18) Character Generator SG Frequency Adjustment
19) DDS Character Position Adjustment

4-5-1. Playback Frequency Characteristic Adjustment (SS-100P Board)

Mode	Playback
Signal	Alignment tape : Frequency characteristic adjustment (WR5-6C)
Measurement point	CH1 : CN508 pin ④ (D SWP) CH2 : CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment element	PB 1-CH : RP-77 board RV102 PB 2-CH : RP-77 board RV101
Specified value	3.58MHz level : 5.5MHz level=4 : 3±0.3

[Adjustment Method]

1) Adjust PB RF OUT of PB 1-CH and PB 2-CH with respective RV so as to get the specified value.

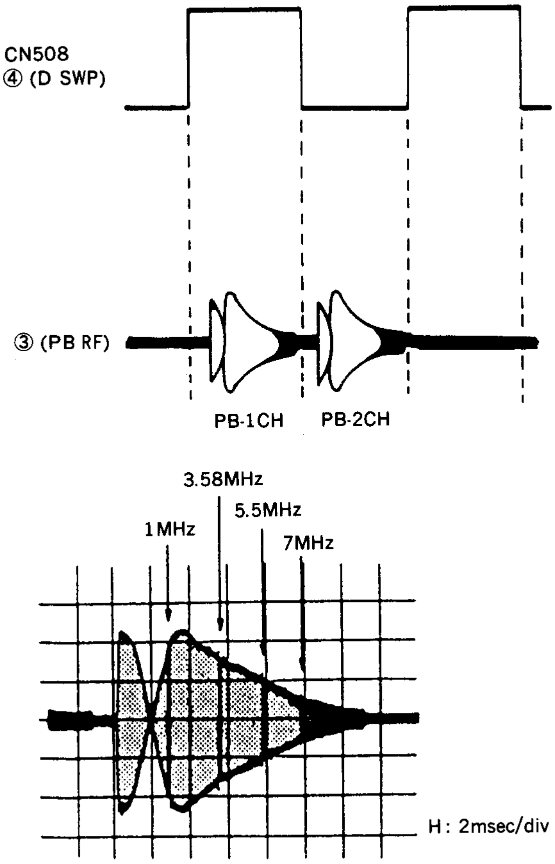

CN508
④ (D SWP)
③ (PB RF)
PB-1CH
PB-2CH
3.58MHz
1MHz
5.5MHz
7MHz
H : 2msec/div

Fig. 4-8.

4-5-2. X'tal Oscillator fo Check (VA-46P Board)

Made	E-E
Signal	Color bar
Measurement point	IC203 pin ⑫
Measuring instrument	Oscilloscope Frequency counter
Specified value	4433619±70Hz

[Check Method]

1) Make sure that the oscillation frequency of IC203 pin ⑫ is 4433619±70Hz.

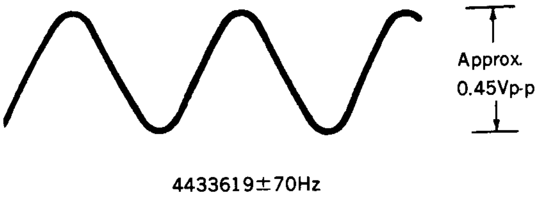

Approx.
0.45Vp-p
4433619±70Hz

Fig. 4-9.

4-5-3. REC E-E Level Adjustment (VA-46P Board)

Mode	Record or E-E
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV205
Specified value	1.000±0.025Vp-p

[Adjustment Method]

1) Adjust to 1.000±0.025Vp-p with RV205.

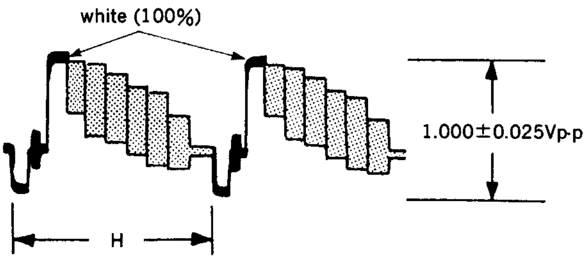

white (100%)
1.000±0.025Vp-p
H

Fig. 4-10.

4-5-4. IR Adjustment (VA-46P Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ⑦
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	Minimum red residual chroma component (50mVp-p or less)

[Connection]

1) Short TP003 and TP007.

[Adjustment Method]

1) Minimize the red residual chroma component with RV201. (50mVp-p or less)
2) After the adjustment, open TP003 and TP007.

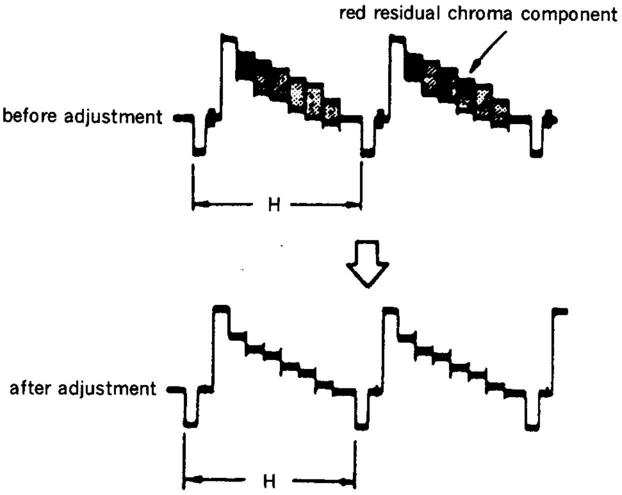

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 4-11.

4-5-5. Chroma Comb Filter Adjustment (VA-46P Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ⑪
Measuring instrument	Oscilloscope
Adjustment element	RV204 RV211
Specified value	Minimum red residual chroma component (40mVp-p or less)

[Adjustment Method]

1) Adjust RV204 and RV211 alternately and minimize the red residual chroma component. (40mVp-p or less)

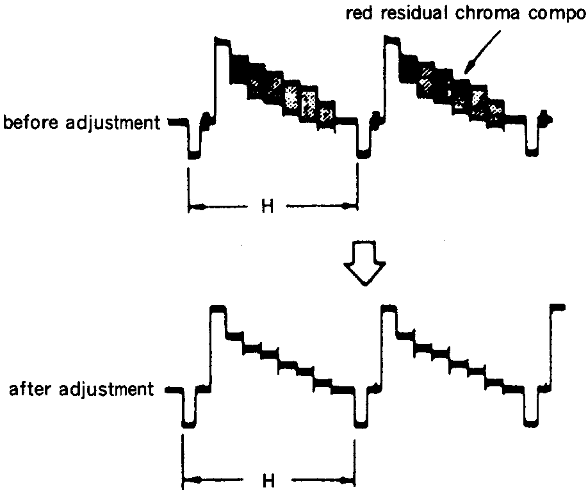

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 4-12.

4-5-6. Emphasis Y Level Adjustment (VA-46P Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ③
Measuring instrument	Oscilloscope
Adjustment element	RV202
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV202.

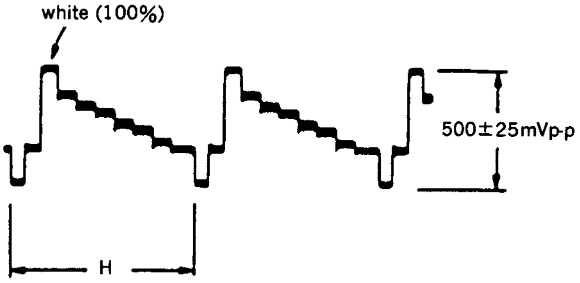

white (100%)
500±25mVp-p
H

Fig. 4-13.

4-5-7. Y FM Carrier Frequency Adjustment (VA-46P Board)

Mode	Record
Signal	Non-signal
Measurement point	IC101 pin ⑭ side terminal of RV101 (REC Y)
Measuring instrument	Frequency counter
Adjustment element	RV207
Specified value	4.38±0.04MHz

[Adjustment Method]

1) Adjust to 4.38±0.04MHz with RV207.
2) Make this adjustment after completing 4-5-8. Y FM Deviation Adjustment.

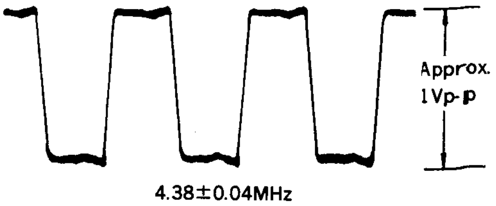

Approx. 1Vp-p
4.38±0.04MHz

Fig. 4-14.

4-5-8. Y FM Deviation Adjustment (VA-46P Board)

Mode	Record and Playback
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV206
Specified value	Playback level of 1.00±0.05Vp-p

Note 1 : 4-5-7. Y FM Carrier Frequerncy adjustment must been completed.

Note 2 : VIDEO OUT terminal (J201) must be terminated at 75Ω.

[Adjustment Method]

1) Record the color bar signal.
2) Playback the recorded signal.
3) Check the playback output level.
   Specified value : 1.00±0.05Vp-p
4) When the specified value is not, turn RV206 as follows and repeat the steps 1) through 3) above.

	RV206 Rotating Direction
When larger than specified value	Clockwise direction (↻)
When smaller than specified value	Counterclockwise direction (↺)

Table. 4-1.

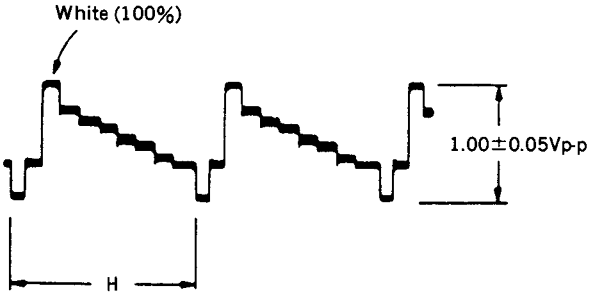


Fig. 4-15.

4-5-9. REC Y FM Level Adjustment (VA-46P Board)

Mode	Record
Signal	Non-signal
Measurement point	CN507 pin ⑤
Measuring instrument	Oscilloscope (20MHz bandwidth ON)
Adjustment element	RV101
Specified value	205±10mVp-p

[Adjustment Method]

1) Adjust to 205±10mVp-p with RV101.

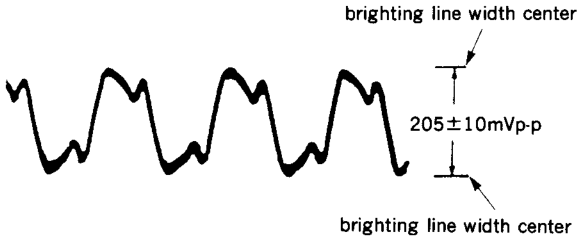


Fig. 4-16.

4-5-10. Chroma Emphasis Adjustment (VA-46P Board)

Mode	Record
Signal	Color bar
Measurement point	IC203 pin ㉔
Measuring instrument	Oscilloscope
Adjustment element	FL302
Specified value	Minimum red level

[Connection]

1) Short between IC203 pin ㉔ and GND at 3.3kΩ resistance.

[Adjustment Method]

1) Minimize the red level with FL302.
2) After the Adjustment, open between IC203 pin ㉔ and GND.

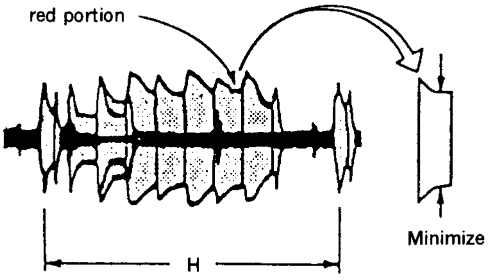


Fig. 4-17.

4-5-11. HUE Phase Deviation Adjustment (VA-46P Board) (Use a Vectorscope)

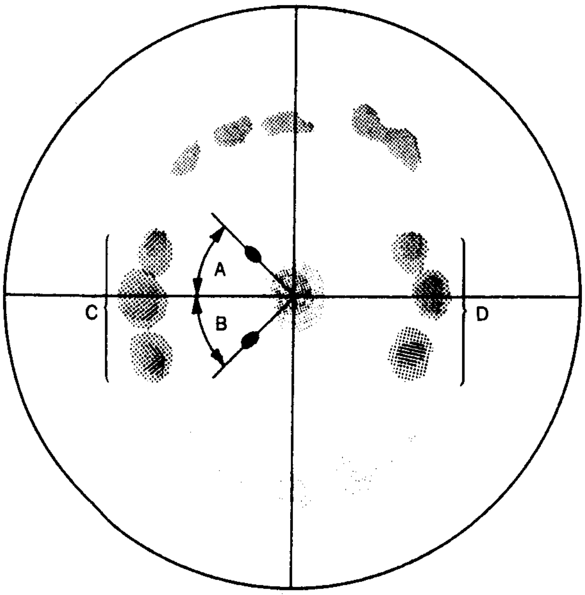
Mode	Playback + Pause
Signal	Alignment tape for operation check (WR5-5CSP), Color bar portion
Measurement point	J201 (VIDEO OUT)
Measurement equipment	Vectorscope
Adjustment element	RV353 (FSC) RV351 (APC LPE)
Specified value	See Fig. 4-18.

[Connection]

1) Input 4.43MHz signal from Pin⑫ of IC203 to 1CH of an oscilloscope.
2) Connect 1CH output of an oscilloscope to the EXT. subcarrier reference input of a vectorscope.
3) Put on the EXT. subcarrier switch of a vectorscope.

[Adjustment Method]

1) Adjust with RV353 so as to equalize A and B as shown in Fig. 4-18.
2) Adjust with RV351 so as to minimize the shaking of each three brighting point of C and D.



RV353: A=B
RV351: make C and D a contrast

Fig. 4-18.

4-5-12. REC Chroma Level Adjustment (VA-46P Board)

Mode	Record
Signal	Color bar
Measurement point	CN507 pin ①
Measuring instrument	Oscilloscope
Adjustment element	RV301
Specified value	Red portion level = 130±10mVp-p

[Adjustment Method]

1) Adjust the red portion to 130±10mVp-p with RV301.

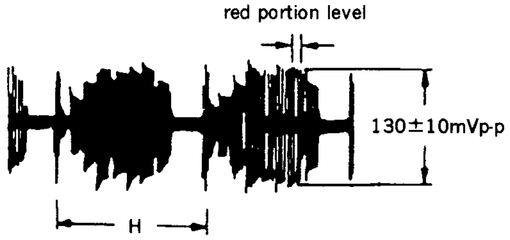


Fig. 4-19.

4-5-13. PB CCD Input Level Adjustment (VA-46P Board)

Mode	Playback
Signal	Alignment tape: Operation check (WR5-5CSP) color bar portion
Measurement point	IC201 pin ㉑
Measuring instrument	Oscilloscope
Adjustment element	RV210
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV210.

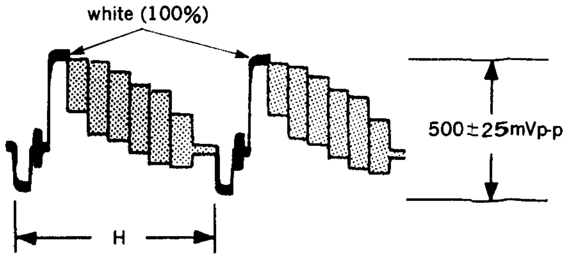


Fig. 4-20.

4-5-14. PB Level Adjustment (VA-46P Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-5CSP) color bar portion
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV203
Specified value	1.00±0.05Vp-p

[Adjustment Method]

1) Adjust to 1.00±0.05Vp-p with RV203.

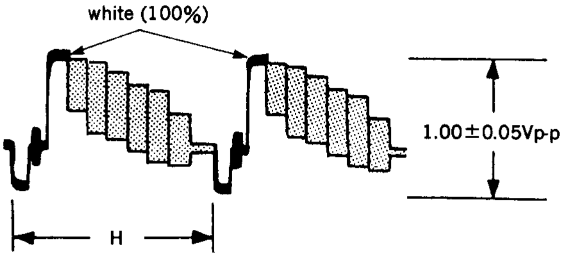


Fig. 4-21.

4-5-15. 4FSC Frequency Adjustment (CT-21P Board)

Mode	E-E
Signal	Non-signal
Measurement point	Q707 Emitter
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT702
Specified value	4433619±50Hz
Adjustment procedure	IC704 pin ⑲ : $5V_{DC}$ IC704 pin ㉝ : $3.5V_{DC}$

[Adjustment Method]

1) Adjust to 4433619±50Hz with CT702.

4-5-16. Controller Frequency Adjustment (CT-21P Board)

Mode	E-E (All title white display)
Signal	Not required
Measurement point	VA-46P board J201 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjustment element	CT701
Specified value	2.0±0.3μ sec

Note : Perform the adjustment with the camera installed.

[Adjustment Method]

1) Display the all title (white) by fetching with the camera E-E.
2) Measure the VIDEO OUT terminal with the oscilloscope, adjust so that the width between the right end of the title and the H-SYNC is 2.0±0.3μ sec.

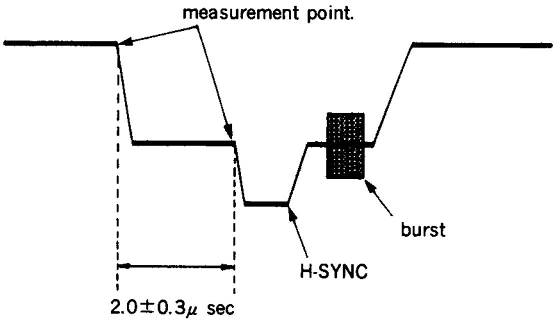


Fig. 4-22.

4-5-17. Tracking TH Adjustment (CT-21P Board)

Mode	E-E
Signal	Staircase (8 stairs)
Measurement point	CH 1 : W704 pin ⑦ (Staircase input) CH 2 : IC703 pin ① (A/D select output)
Measuring instrument	Oscilloscope
Adjustment element	RV703
Specified value	Staircases to the second stair should be fetched and the third one should not be fetched.

[Adjustment Method]

1) Adjust to satisfy the specified value with RV703. (Refer to Fig. 4-23.

Note : In the case that ten staircases are used. the third stair should be fetched and the fourth one should not be fetched.

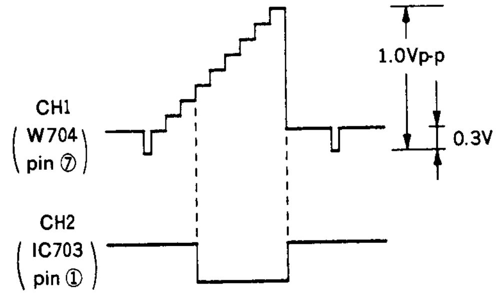


Fig. 4-23.

4-5-18. Character Generator SG Frequency Adjustment (CT-21P Board)

Mode	E-E
Signal	Non-signal
Measurement point	IC902 pin ⑲
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT901
Specified value	1562500±100Hz

[Adjustment Method]

1) Adjust to 1562500±100Hz with CT901.

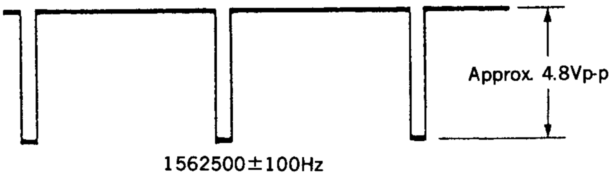


Fig. 4-24.

4-5-19. DDS Character Position Adjustment (CT-21P Board)

Mode	E-E
Signal	Color bar
Measurement point	EVF
Measuring instrument	EVF
Adjustmen element	CT902
Specified value	Refer to Fig. 4-25.

[Adjustment Method]

1) Turn on the DATA SCREEN switch (VK-10P board S508). (Check that it is displayed on the EVF.)
2) Adjust the last inner line to the dividing line between red and blue with CT902. (Refer to Fig. 4-25)
3) Turn off the DATA SCREEN switch (VK-10P board S508). (Check that it went out on the EVF.)

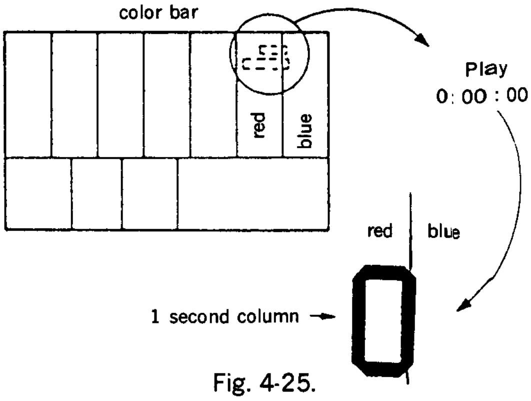


Fig. 4-25.

4-6. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instrument]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

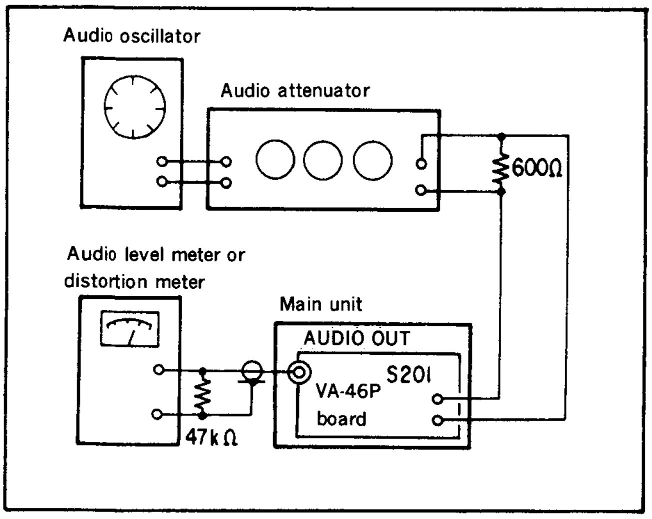

Audio oscillator
Audio attenuator
600Ω
Audio level meter or distortion meter
Main unit
AUDIO OUT
S201
VA-46P board
47kΩ

Fig. 4-26.

4-6-1. AFM Carrier Frequency Check (VA-46P Board)

Mode	Recording (Stereo mode)
Signal	Non-signal
Measurement point	IC400 pin (53) (REC AFM)
Measuring instrument	Frequency counter
Specified value	1.50±0.01MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Checking Method]

1) Turn OFF the audio oscillator output.
2) Confirm that the AFM carrier frequency is 1.50±0.01MHz.

4-6-2. REC AFM Carrier Level Adjustment (VA-46P Board)

Mode	Recording (Monoral)
Signal	Non-signal
Measurement point	IC400 pin (53) (REC AFM)
Measuring instrument	Oscilloscope
Specified value	160±5mVp-p

[Checking Method]

1) Confirm that the level is 160±5mVp-p.

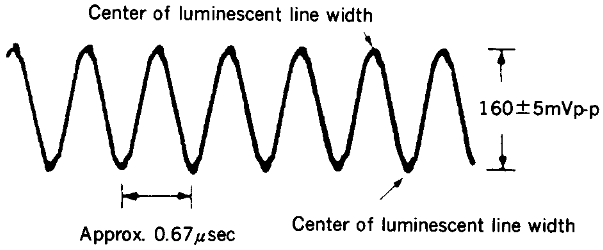

Center of luminescent line width
160±5mVp-p
Approx. 0.67μsec
Center of luminescent line width

Fig. 4-27.

4-6-3. Playback Level Check

Mode	Playback
Signal	Alignment tape: Operation checking (WR5-5CSP)
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Confirm that the audio output level is −7.5±2dBs.

4-6-4. E-E Output Level Check

Mode	E-E
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±3dBs

[Checking Method]

1) Make sure that the audio output level is −7.5±3dBs.

4-6-5. Overall Level Characteristics Check

Mode	Self-recording and playback
Signal	400Hz, −7.5dBs.
Measuremrnt point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±3dBs.

[Checking Method]

1) Record the signal.
2) Playback the recorded section
3) Make sure that the audio output level is −7.5±3dBs.

4-6-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, −17.5dBs Ⓑ 30Hz, −17.5dBs Ⓒ 10Hz, −17.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	With the 400Hz playback output level as 0dB, the playback output level of 30Hz and 10kHz is 0±3dB

[Checking Method]

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback output level as 0dB, confirm that the playback output level of 30Hz and 10kHz is 0± 3dB.

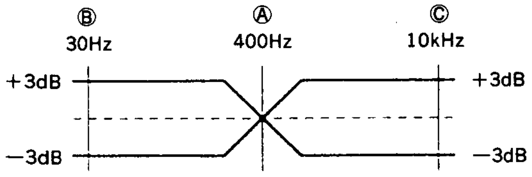


Fig. 4-28.

4-6-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Distorsion meter
Specified value	Less than 0.8%*1

[Checking Method]

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.8%.*1

* 1 Value when 200Hz to 3kHz BPF is used.

4-6-8. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (Shorting plug is inserted into audio input jack)
Measurement point	Audio input terminal
Measuring instrument	Audio level meter
Specified value	Less than −62.0dBs*2

[Checking Method]

1) Record the signal
2) Playback the recorded section
3) Make sure that the noise level is less than −62.0dBs.*2

* 2 Value when IHF-A hearing correction filter is used.

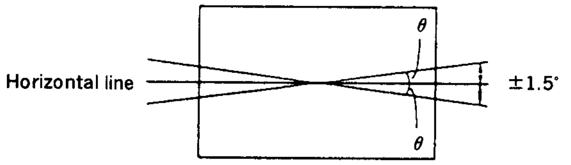
4-7. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE A) (VF-27P BOARD)

4-7-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-29.

[Adjustment Method]

1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
±1.5°
θ

Specified value: Image orientation within±1.5° of horizontal line.

Fig. 4-29.

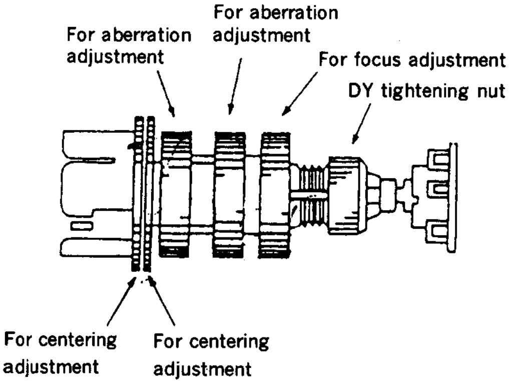

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 4-30.

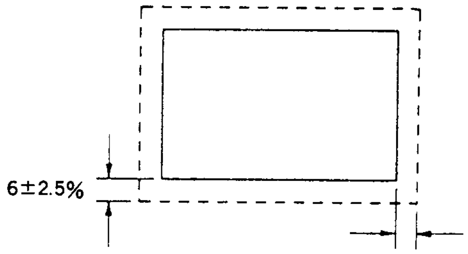
4-7-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-31.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even night, left, upper and lower margins. (See Fig. 4-30.)

Note : Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.



Adjustment Value: 6±2.5% 6±2.5%

Fig. 4-31.

4-7-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

[Adjustment Method]

1) Adjust for optimum focus using the focus ring. (See Fig. 4-30.)

4-7-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified value	See Fig. 4-32.

[Adjustment Method]

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

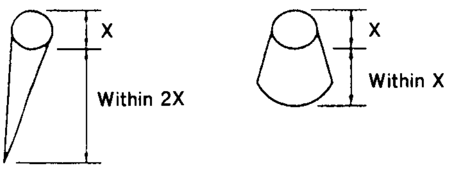


Fig. 4-32.

4-7-5. Horizontal Oscillation Frequency Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement point	CN904 pin ⑤
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	RV901
Specified value	$2.60 \pm 0.05 V_{DC}$

[Adjustment Method]

1) Adjust to $2.60 \pm 0.05 V_{DC}$ using RV901.

4-7-6. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for cheking operation (WR5-5CSP) Monoscope portion
Adjustment element	C911
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
2) Rotate RV904 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of 6.0±3.0% (total of left and right).
(See Fig. 4-34.)

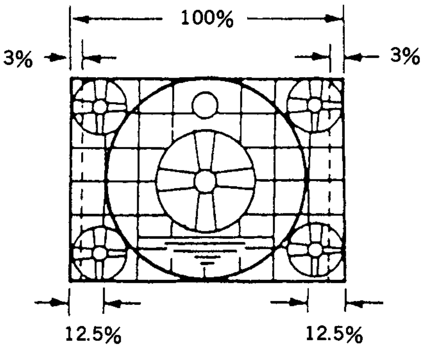
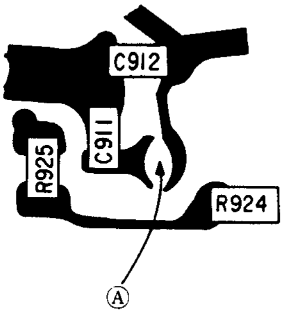


Fig. 4-33.



VF-27P Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 4-34.

4-7-7. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV902
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning RV902, adjust vertical overscan to 6.0±3.0% (upper and lower total).

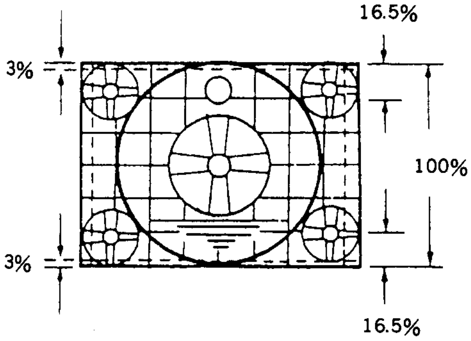


Fig. 4-35.

4-7-8. Brightness, Contrast Adjustments

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness : RV904 Contrast : RV903

[Adjustment Method]

1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

4-7-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 4-7-6. Horizontal Amplitude Adjustment and 4-7-7. Vertical Amplitude Adjustment. If not. readjust accordingly, and repeat 4-7-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 4-7-3. Focus Adjustment and 4-7-4. Aberration Adjustment.

4-8. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE B) (VF-26P BOARD)

4-8-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-37.

[Adjustment Method]

1) Adjust the volume array Ⓓ (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 4-38.)
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 4-36.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

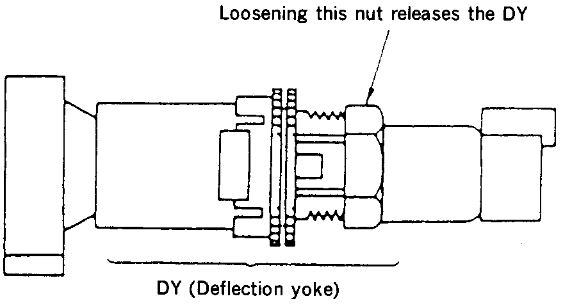
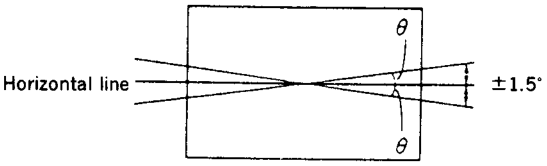
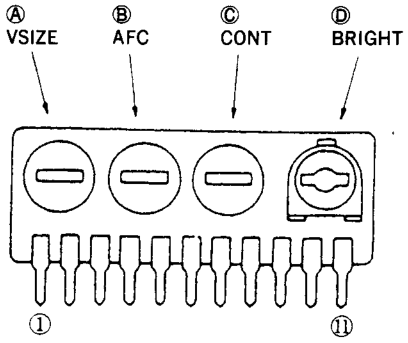


Fig. 4-36.



Specified value: Image orientation within±1.5° of horizontal line.

Fig. 4-37.



Volume array (CP901)

Fig. 4-38.

4-8-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-40.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 4-38.)

Note : Since the cenering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

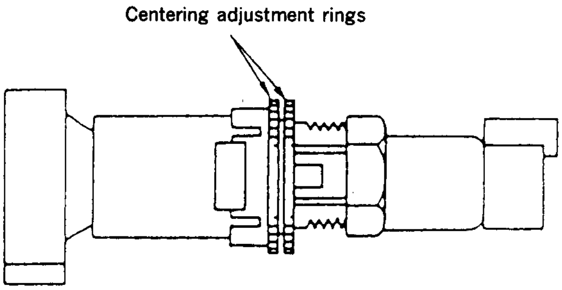


Fig. 4-39.

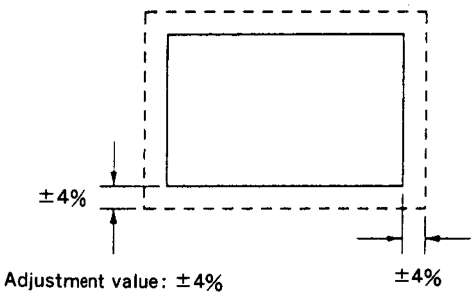


Fig. 4-40.

4-8-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ (AFC)
Specified value	$2.6 \pm 0.1V_{DC}$

[Adjustment Method]

1) Adjust volume array Ⓑ (AFC) for $2.6 \pm 0.1V_{DC}$. (See Fig. 4-38.)

4-8-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	C905
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower section of monoscope image with the upper and lower edges of the screen by rotating volume array Ⓐ (V SIZE). (See Fig. 4-38.)
2) Rotate volume array Ⓓ (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C905) to provide horizontal overscans of 6.0± 3.0% (total of left and right). (See Fig. 4-42.)

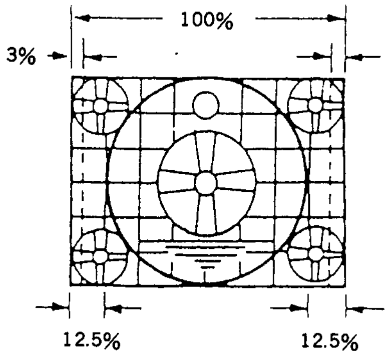
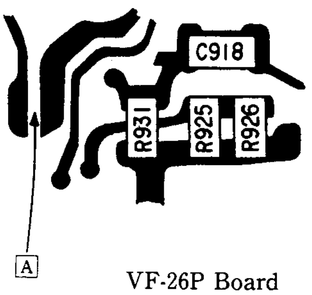


Fig. 4-41.



VF-26P Board (conductor side)

A section	H size
Open	Large
Short	Small

Fig. 4-42.

4-8-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Volume array Ⓐ (V SIZE)
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning volume array Ⓐ (V SIZE), adjust vertical overscan to 6.0±3.0% (upper and lower total). (See Fig. 4-43.)

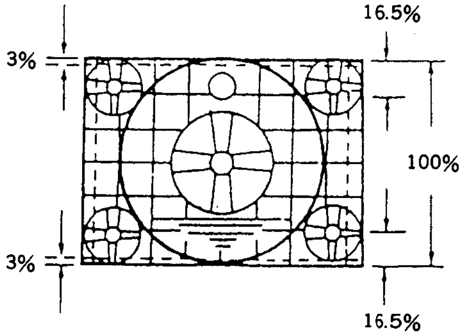


Fig. 4-43.

4-8-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV901

[Adjustment Method]

1) Adjust to the best focus point with RV901.

4-8-7. Brightness, Contrast Adjustments

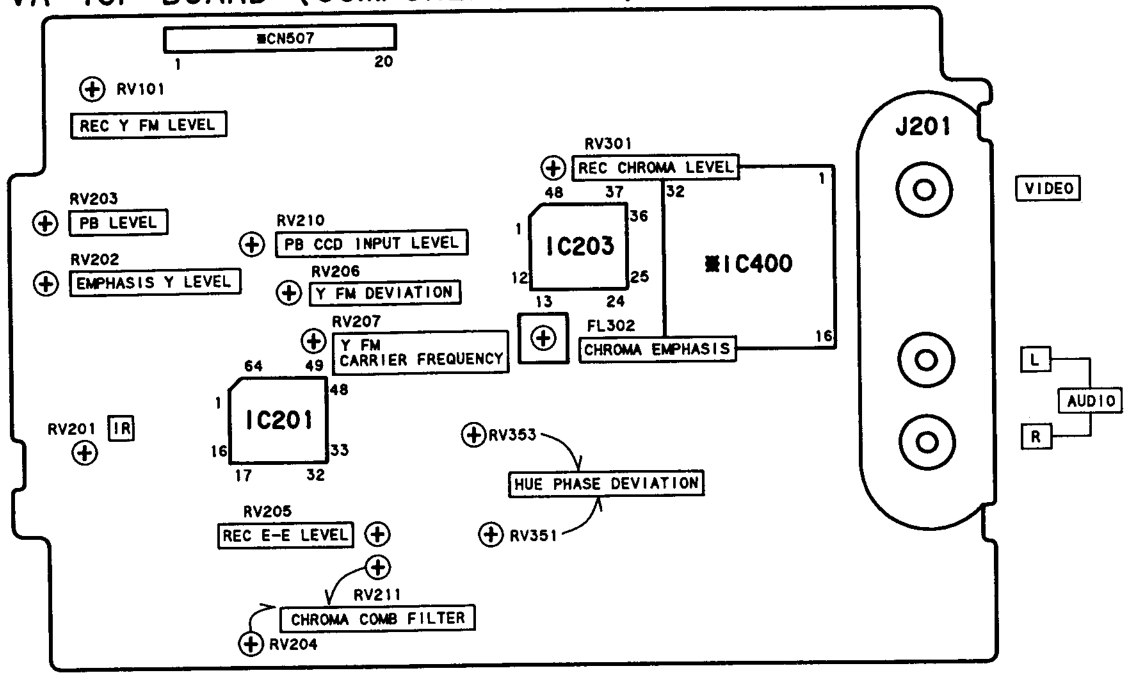
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness: Volume array Ⓓ (BRIGHT) Contrast: Volume array Ⓒ (CONT)

[Adjustment Method]

1) Adjust volume array Ⓓ (BRIGHT) and Ⓒ(CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest areas is possible.) (See Fig. 4-38.)

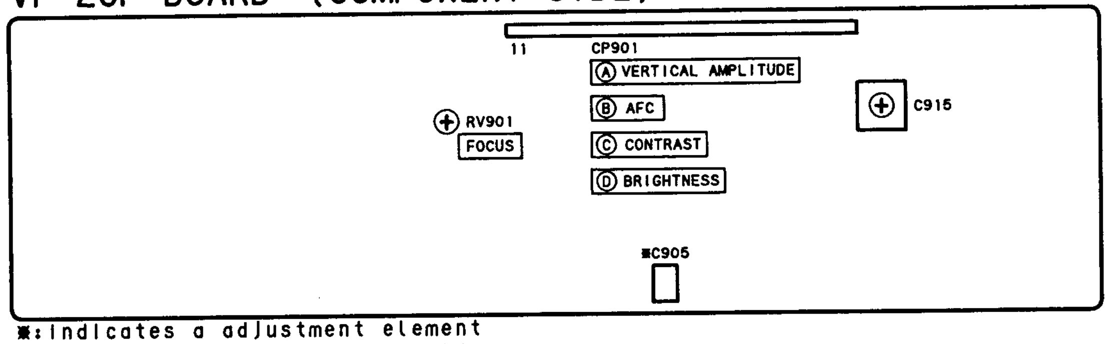
4-9. ADJUSTING PART LOCATION DIAGRAM

VA-46P BOARD (COMPONENT SIDE)


✱CN507
1
20
RV101
REC Y FM LEVEL
RV203
PB LEVEL
RV202
EMPHASIS Y LEVEL
RV210
PB CCD INPUT LEVEL
RV206
Y FM DEVIATION
RV207
Y FM CARRIER FREQUENCY
RV301
REC CHROMA LEVEL
IC203
✱IC400
FL302
CHROMA EMPHASIS
IC201
RV201
IR
RV353
HUE PHASE DEVIATION
RV351
RV205
REC E-E LEVEL
RV211
CHROMA COMB FILTER
RV204
J201
VIDEO
L
R
AUDIO

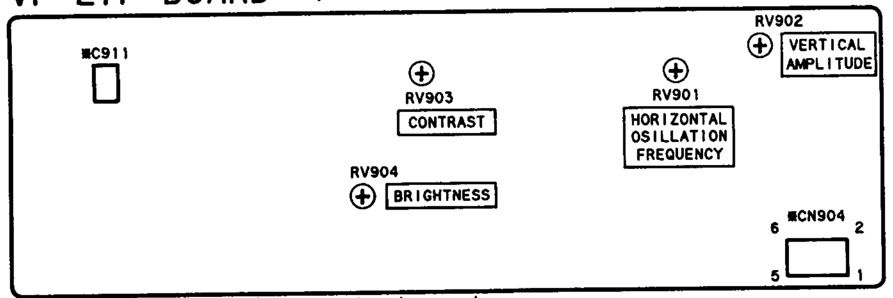
✱: Indicates a adjustment element mounted on the conductor side.

VF-26P BOARD (COMPONENT SIDE)


11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
✱C905

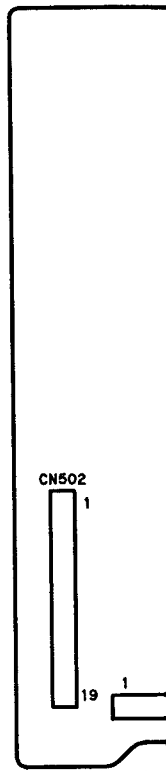
✱: Indicates a adjustment element mounted on the conductor side.

VF-27P BOARD (COMPONENT SIDE)


✱C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL OSILLATION FREQUENCY
RV902
VERTICAL AMPLITUDE
✱CN904
6
2
5
1

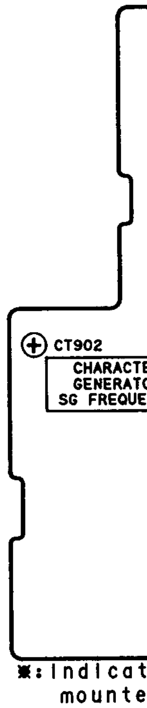
✱: Indicates a adjustment element mounted on the conductor side.

SS-100P



✱: Indicate
mounted

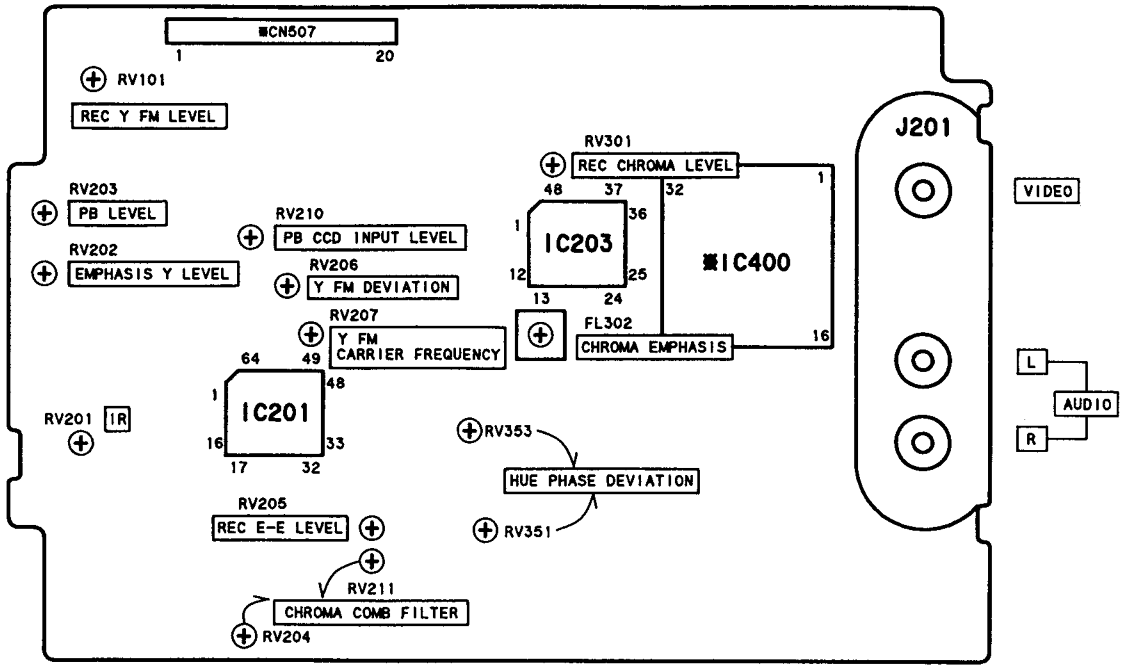
CT-21P


CT902
CHARACTE
GENERATO
SG FREQUE

✱: Indicat
mounte

4-9. ADJUSTING PART LOCATION DIAGRAM

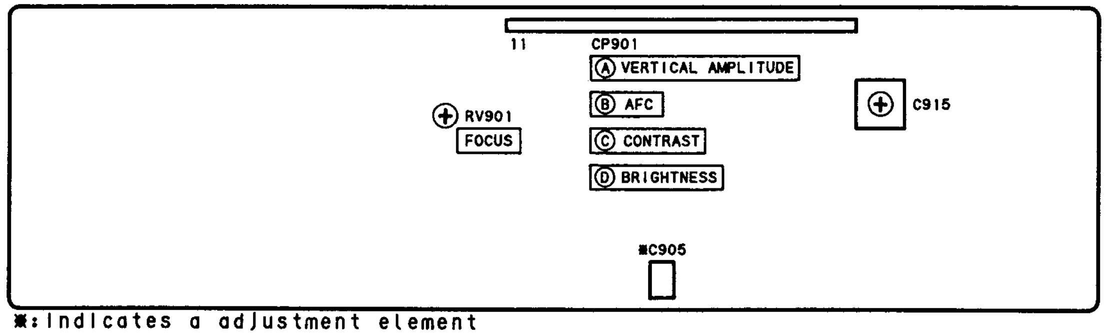
VA-46P BOARD (COMPONENT SIDE)



*CN507
1
20
RV101
REC Y FM LEVEL
RV203
PB LEVEL
RV202
EMPHASIS Y LEVEL
RV210
PB CCD INPUT LEVEL
RV206
Y FM DEVIATION
RV207
Y FM CARRIER FREQUENCY
RV301
REC CHROMA LEVEL
IC203
48
37
32
36
1
12
25
13
24
*IC400
1
16
FL302
CHROMA EMPHASIS
J201
VIDEO
L
AUDIO
R
IC201
64
49
48
1
16
33
17
32
RV201
IR
RV353
HUE PHASE DEVIATION
RV351
RV205
REC E-E LEVEL
RV211
CHROMA COMB FILTER
RV204

*: Indicates a adjustment element mounted on the conductor side.

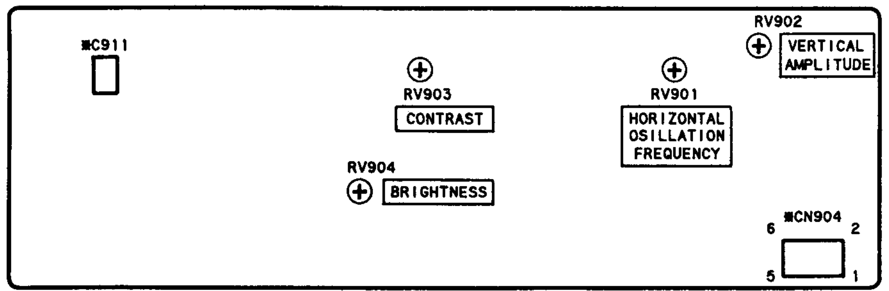
VF-26P BOARD (COMPONENT SIDE)



11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
*C905

*: Indicates a adjustment element mounted on the conductor side.

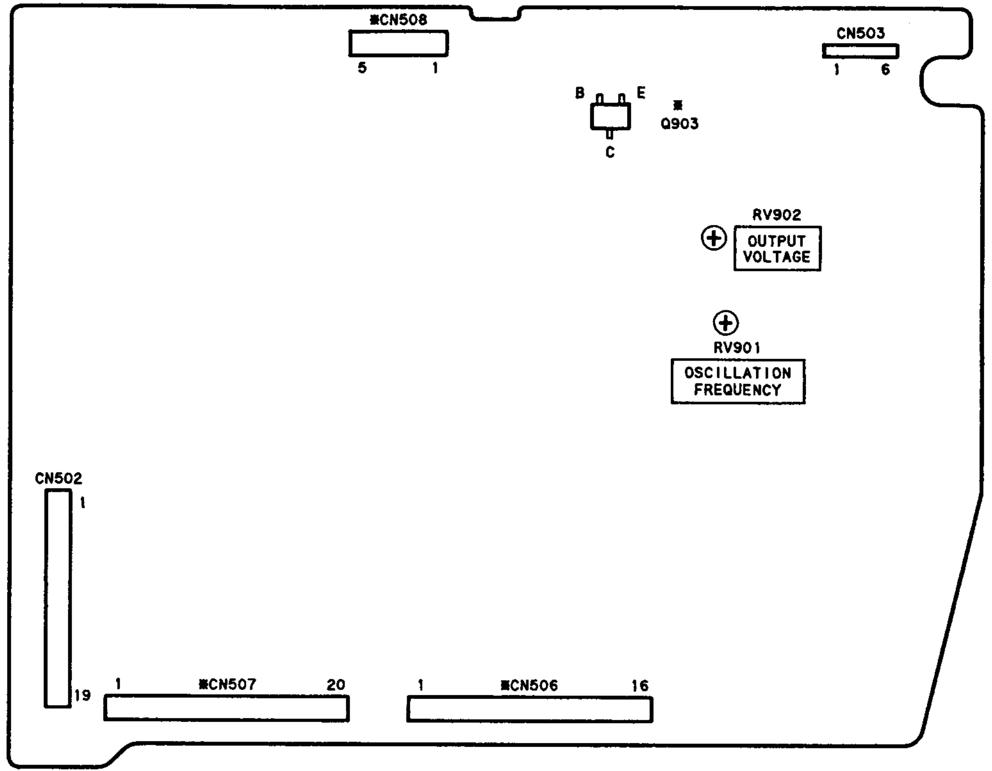
VF-27P BOARD (COMPONENT SIDE)



*C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL OSILLATION FREQUENCY
RV902
VERTICAL AMPLITUDE
*CN904
6
2
5
1

*: Indicates a adjustment element mounted on the conductor side.

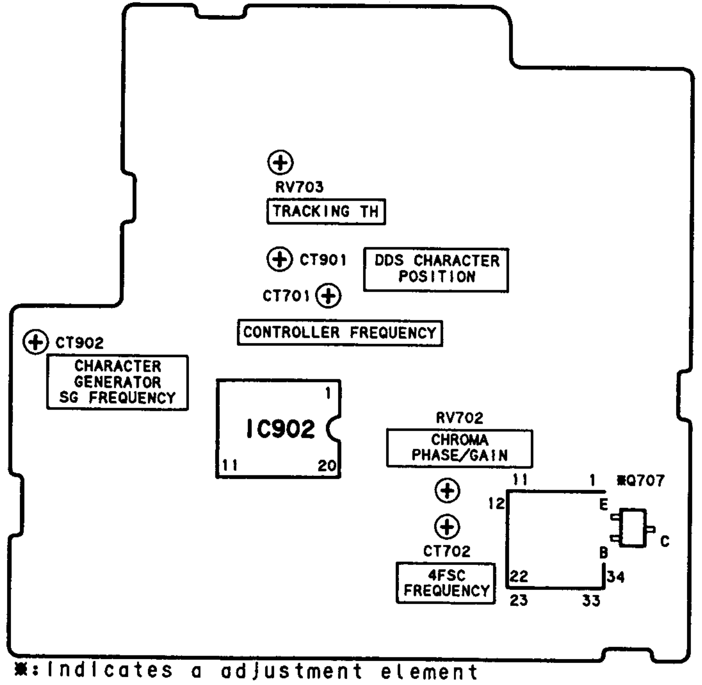
SS-100P BOARD (COMPONENT SIDE)



*CN508
5
1
CN503
1
6
B
E
C
*Q903
RV902
OUTPUT VOLTAGE
RV901
OSCILLATION FREQUENCY
CN502
1
19
1
*CN507
20
1
*CN506
16

*: Indicates a adjustment element mounted on the conductor side.

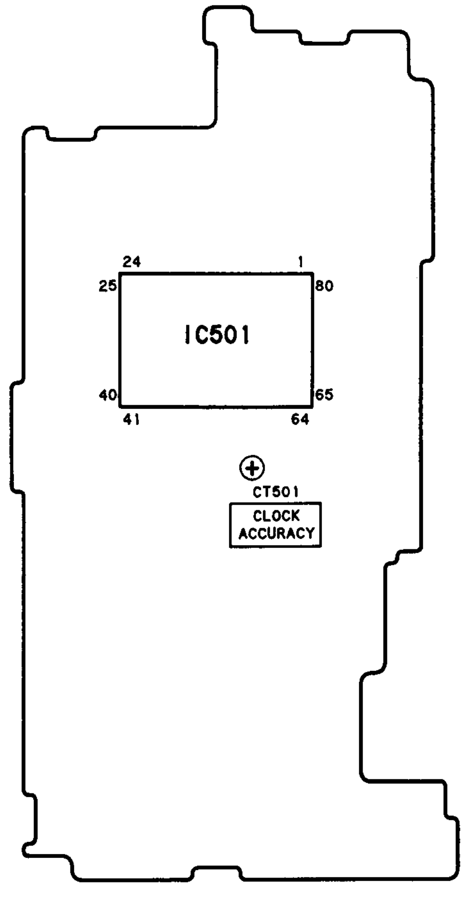
CT-21P BOARD (COMPONENT SIDE)



RV703
TRACKING TH
CT901
DDS CHARACTER POSITION
CT701
CONTROLLER FREQUENCY
CT902
CHARACTER GENERATOR SG FREQUENCY
IC902
1
11
20
RV702
CHROMA PHASE/GAIN
11
1
*Q707
12
E
B
C
CT702
4FSC FREQUENCY
22
34
23
33

*: Indicates a adjustment element mounted on the conductor side.

FU-72P BOARD
(COMPONENT SIDE)



24
1
25
80
IC501
40
65
41
64
CT501
CLOCK ACCURACY

CCD-F450E
RMT-502

SONY®
SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model

SUPPLEMENT-3

- **PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM (VA-46P BOARD)**
- **ELECTRICAL PARTS LIST (VA-46P BOARD)**
- **ADJUSTMENT (AUDIO BLOCK)**

File this supplement-3 with the service manual, supplement-1 and -2.

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D202	8-719-941-86	DAN202U
D203	8-719-941-86	DAN202U
D204	8-719-404-46	MA110 (E, AUS)
D205	8-719-941-86	DAN202U
D207	8-719-941-86	DAN202U (E, AUS)
D208	8-719-941-86	DAN202U
D209	8-719-941-86	DAN202U
D210	8-719-404-46	MA110
D212	8-719-941-86	DAN202U
D214	8-719-940-45	MA159
D215	8-719-404-46	MA110
D216	8-719-404-46	MA110
D217	8-719-800-76	1SS226
D351	8-719-404-46	MA110
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IC101	8-759-012-00	MC10H116M
IC201	8-752-036-19	CXA1207R
IC202	8-752-335-88	CXL1506M
IC203	8-752-036-20	CXA1208R
IC204	8-759-605-61	CXA1203N
IC205	8-759-710-29	NJM2235M
IC206	8-759-320-76	HA118070FP
IC207	8-759-710-07	NJM2234M
IC400	8-759-823-19	CXA1488R
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Q002	8-729-905-35	2SC4081-R
Q004	8-729-905-35	2SC4081-R
Q005	8-729-905-35	2SC4081-R
Q059	8-729-905-18	DTC144EU
Q060	8-729-905-18	DTC144EU
Q061	8-729-905-18	DTC144EU
Q062	8-729-905-18	DTC144EU
Q063	8-729-905-12	DTA144EU
Q101	8-729-905-23	2SA1576-R
Q102	8-729-905-18	DTC144EU
Q105	8-729-905-35	2SC4081-R
Q106	8-729-102-07	2SC2223-F13
Q107	8-729-905-12	DTA144EU
Q109	8-729-905-35	2SC4081-R
Q115	8-729-905-35	2SC4081-R
Q117	8-729-905-35	2SC4081-R
Q118	8-729-905-23	2SA1576-R
Q119	8-729-905-35	2SC4081-R
Q121	8-729-141-48	2SB624-BV345
Q122	8-729-102-07	2SC2223-F13
Q123	8-729-905-35	2SC4081-R
Q130	8-729-905-35	2SC4081-R
Q131	8-729-905-23	2SA1576-R
Q140	8-729-905-12	DTA144EU
Q141	8-729-905-35	2SC4081-R
Q142	8-729-141-48	2SB624-BV345
Q154	8-729-905-35	2SC4081-R
Q171	8-729-905-35	2SC4081-R
Q172	8-729-905-35	2SC4081-R
Q191	8-729-905-35	2SC4081-R
Q192	8-729-905-18	DTC144EU
Q195	8-729-905-12	DTA144EU
Q196	8-729-905-18	DTC144EU
Q201	8-729-905-35	2SC4081-R
Q202	8-729-905-12	DTA144EU
Q203	8-729-905-23	2SA1576-R
Q204	8-729-905-35	2SC4081-R
Q205	8-729-100-66	2SC1623 (E, AUS)
Q206	8-729-905-35	2SC4081-R
Q209	8-729-905-18	DTC144EU
Q210	8-729-905-23	2SA1576-R
Q211	8-729-905-35	2SC4081-R
Q212	8-729-905-35	2SC4081-R
Q215	8-729-905-23	2SA1576-R
Q216	8-729-905-18	DTC144EU (E, AUS)
Q220	8-729-141-48	2SB624-BV345
Q221	8-729-905-18	DTC144EU
Q222	8-729-905-12	DTA144EU
Q223	8-729-905-35	2SC4081-R
Q224	8-729-905-35	2SC4081-R
Q225	8-729-905-12	DTA144EU
Q226	8-729-905-35	2SC4081-R
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Q231	8-729-905-35	2SC4081-R
Q232	8-729-905-35	2SC4081-R
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Q240	8-729-905-35	2SC4081-R
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Q245	8-729-905-XX	DTC114TU
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Q247	8-729-905-XX	DTC114TU
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Q251	8-729-905-18	DTC144EU
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Q304	8-729-905-35	2SC4081-R
Q306	8-729-905-35	2SC4081-R
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Q352	8-729-905-35	2SC4081-R
Q353	8-729-905-35	2SC4081-R
Q354	8-729-905-35	2SC4081-R
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Q358	8-729-905-18	DTC144EU
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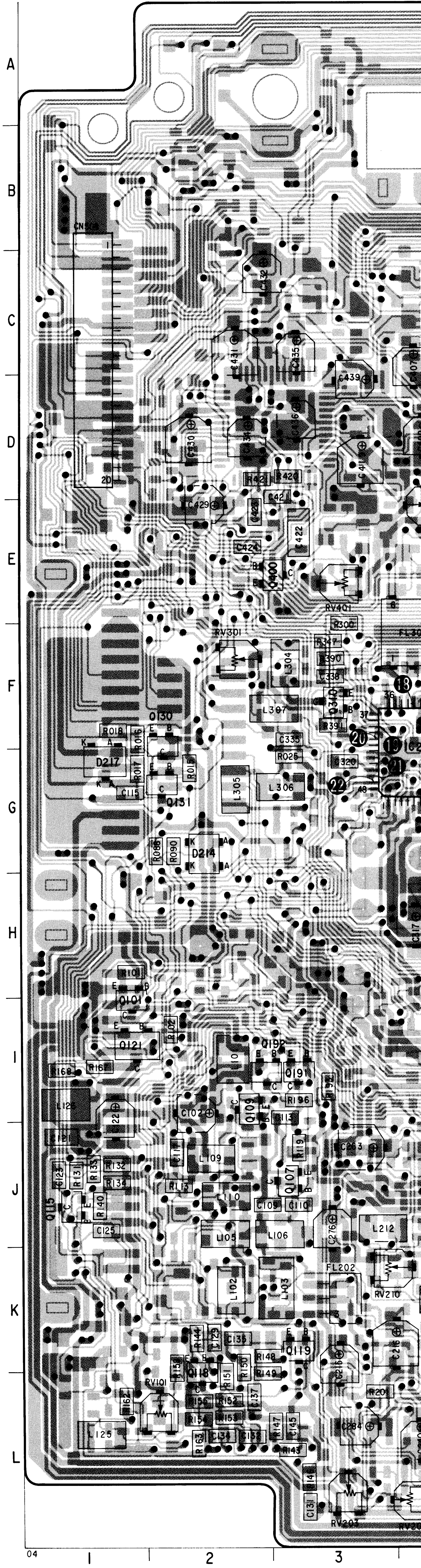
Q360	8-729-905-18	DTC144EU
Q362	8-729-905-18	DTC144EU
Q400	8-729-905-18	DTC144EU
Q404	8-729-904-07	FMG2

VA-46P (VIDEO/AUDIO) PRINTED WIRING BOARD

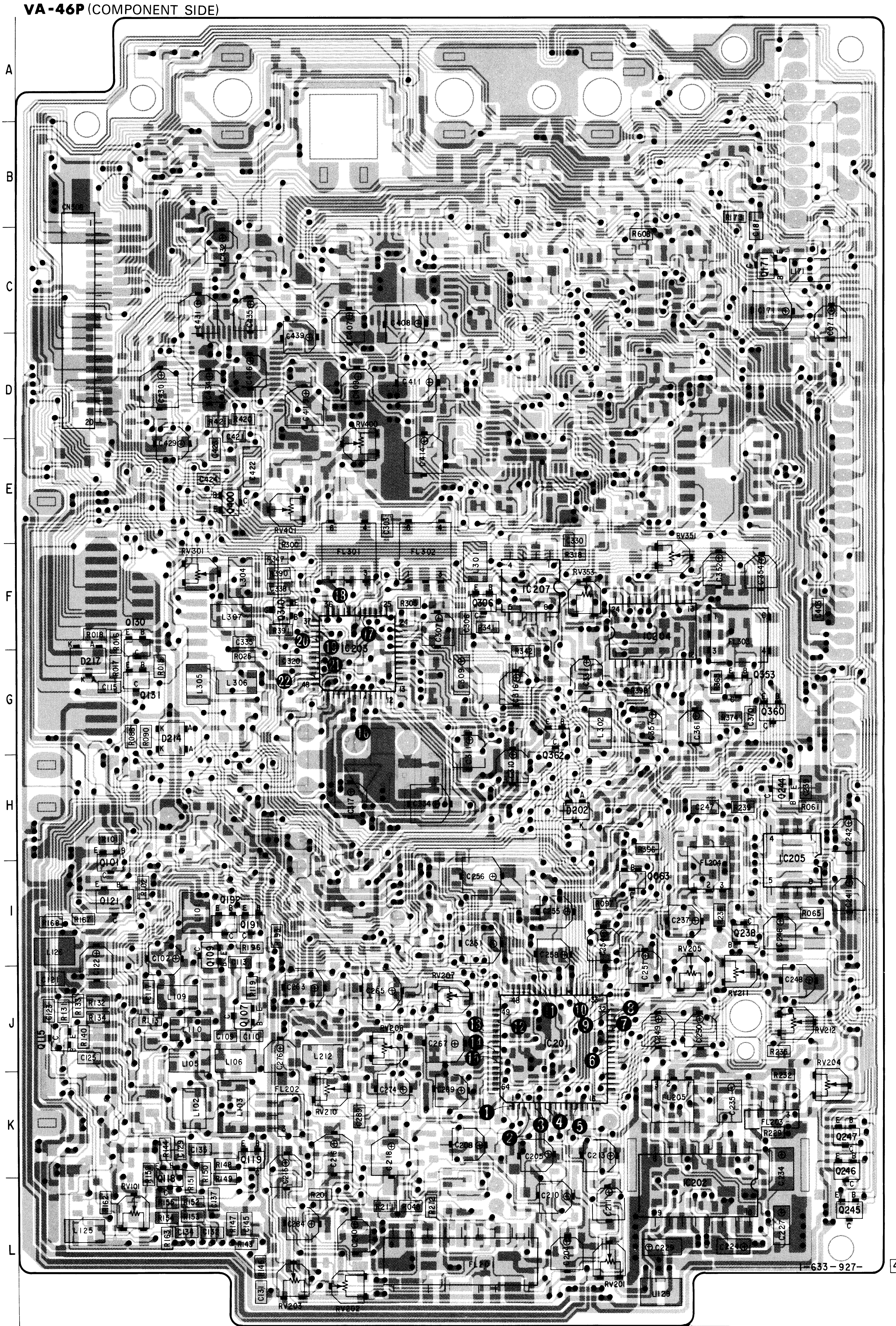
—Ref. No. VA-46P BOARD: 3000 series—

VA-46P (COMPONENT SIDE)

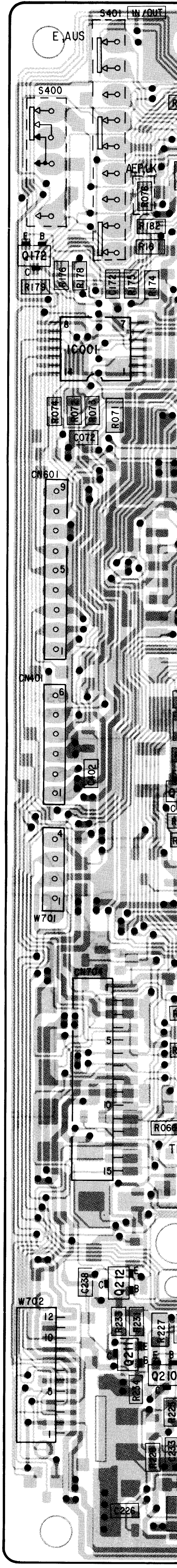


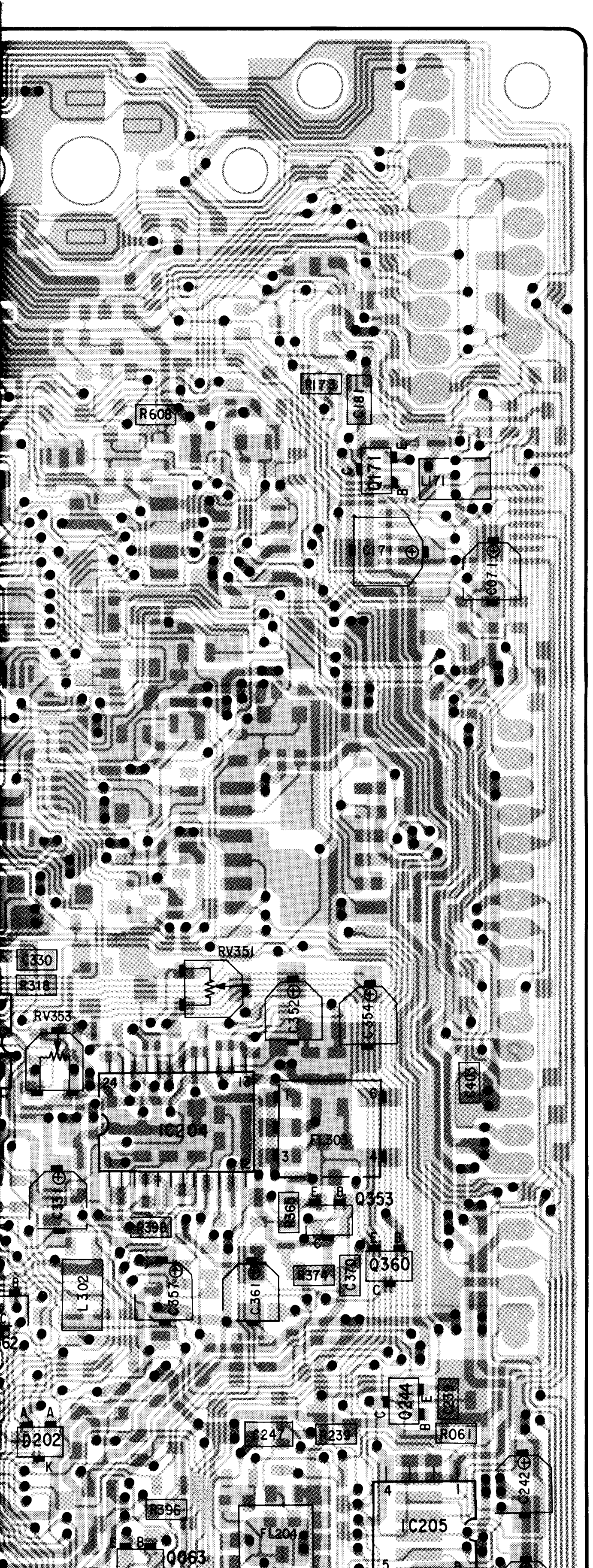
VA-46P (VIDEO/AUDIO) PRINTED WIRING BOARD
—Ref. No. VA-46P BOARD: 3000 series—

VA-46P (COMPONENT SIDE)

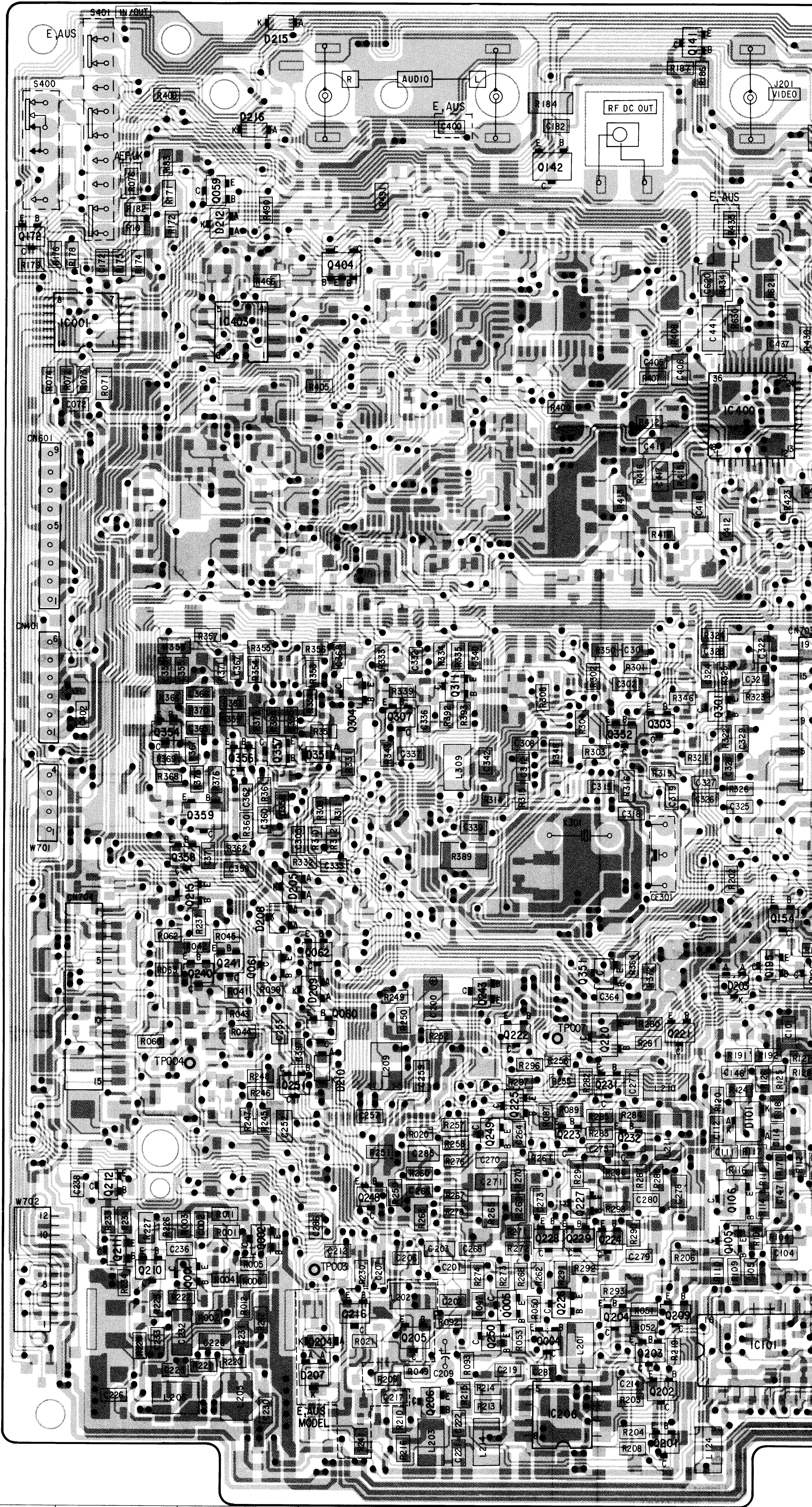

A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
CN508
IC201
IC202
IC203
IC204
IC205
IC207
FL301
FL302
FL202
FL203
FL204
FL205
D217
D214
D202
Q130
Q131
Q101
Q121
Q107
Q119
Q118
Q171
Q306
Q353
Q360
Q362
Q363
Q238
Q244
Q245
Q246
Q247
Q400
RV101
RV201
RV202
RV203
RV204
RV205
RV206
RV207
RV210
RV211
RV212
RV301
RV351
RV353
RV400
RV401
1-633-927-
41
04

VA-46PBOARD (CO


S401
IN/OUT
S400
E AUS
AFPUK
Q172
IC001
CN601
CN401
W701
W702
CN702
Q212
Q210
Q211
9
10


IC204
IC205
IC202
FL204
FL205
FL203
FL303
RV351
RV353
RV205
RV211
RV212
RV204
RV201
Q353
Q360
Q244
Q238
Q247
Q246
Q245
Q063
D202
L302
1-633-927-
41
6
7
8

VA-46P BOARD (CONDUCTOR SIDE)


S401
IN/OUT
S400
E AUS
AEF/UK
R
AUDIO
L
E AUS
IC400
RF DC OUT
J201
VIDEO
Q141
Q142
Q172
Q216
D215
D212
Q059
Q404
IC001
IC403
IC400
CN601
CN401
W701
W702
CN701
L309
X301
CE301
TP004
TP007
TP003
IC101
IC206
E AUS MODEL
9
10
11
12
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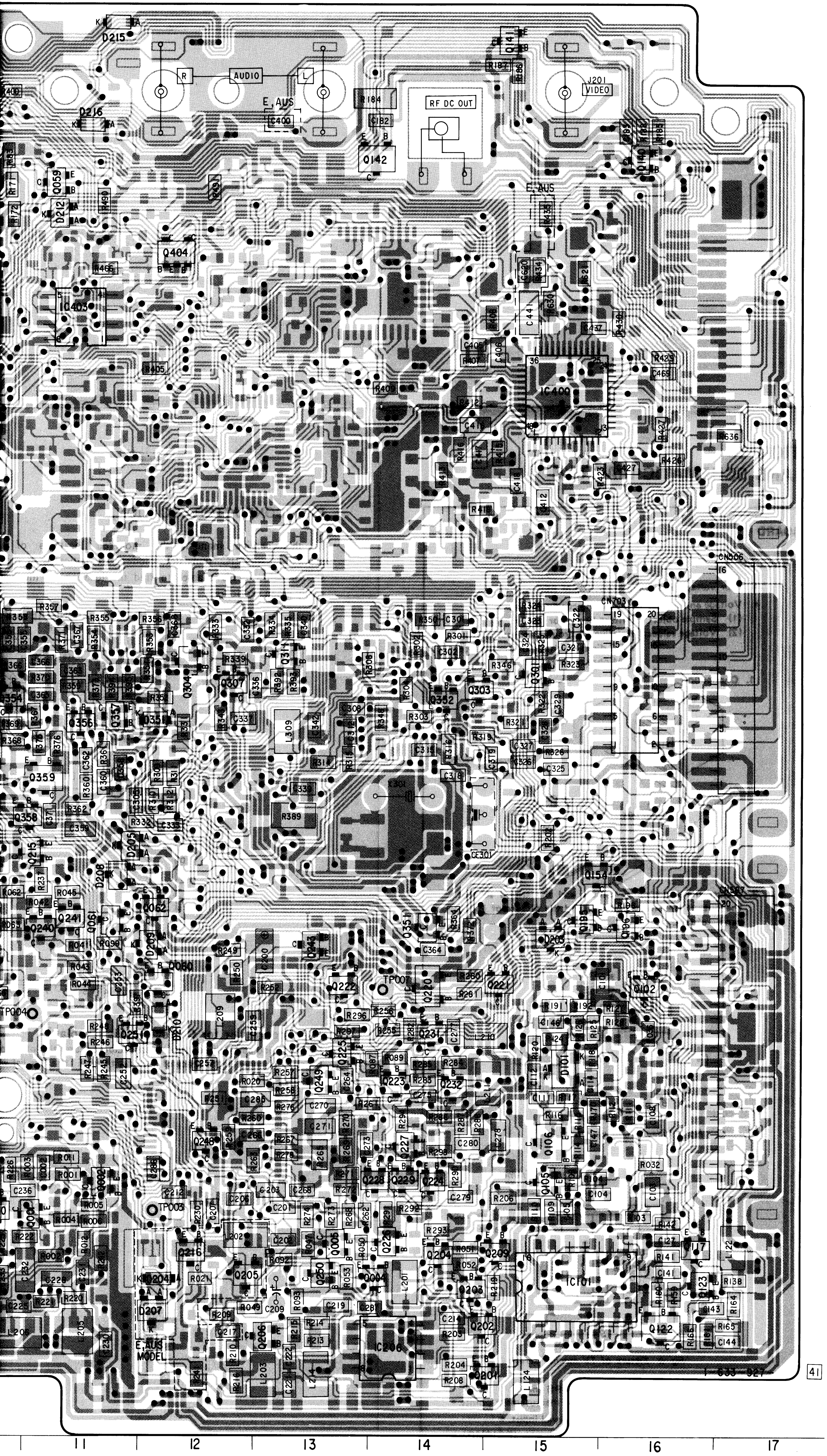
14
15

ONDUCTOR SIDE)


D215
R
AUDIO
L
J201
VIDEO
E, AUS
IC400
R184
C182
RF DC OUT
Q142
Q141
R187
E, AUS
D216
Q059
D212
Q404
IC403
IC400
R405
R409
R412
R418
CN306
CN703
L309
X301
Q303
Q302
Q356
Q359
Q358
D205
D206
Q241
Q240
TP004
TP001
Q222
Q221
Q210
Q231
Q223
Q232
Q249
Q225
Q248
Q227
Q228
Q229
Q224
TP003
Q216
D204
D207
E,AUS
MODEL
Q205
Q250
Q204
Q203
Q202
Q201
Q206
IC206
IC101
D101
Q106
Q105
Q122
Q123
Q154
CN307
1-633-527
41
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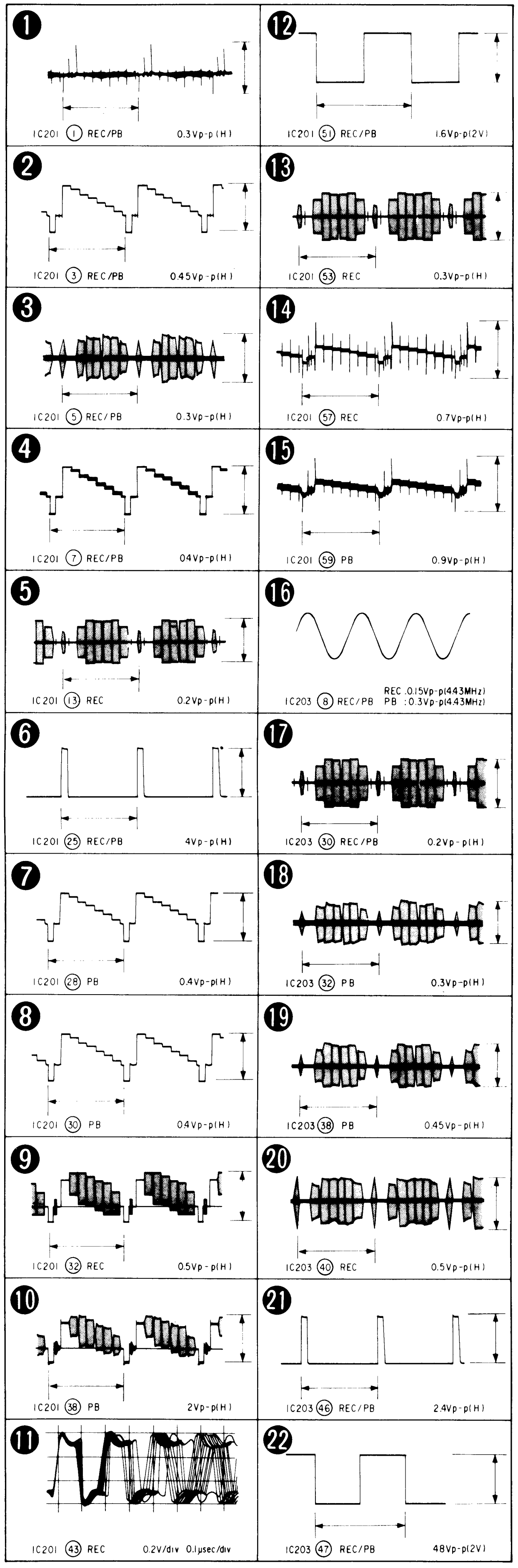
16
17

VA-46P BOARD



SECTION 1
PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

THIS NOTE IS COMMON FOR PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ■ : Pattern of the rear side.*
- Circled numbers refer to waveforms.

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/16W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.

- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ━ : B + Line*
- Circled numbers refer to waveforms.*
- ⇨ : IN/OUT direction of B (+, −) line.*

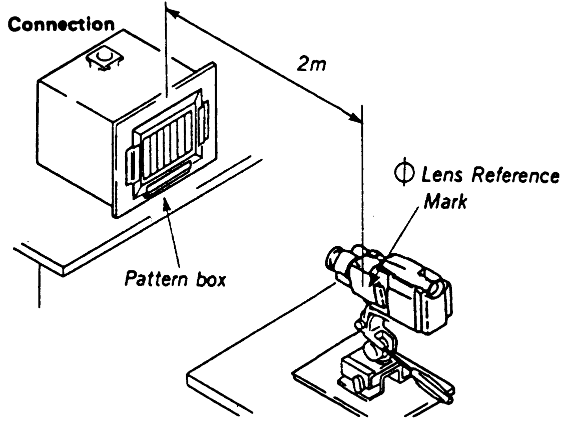
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

* Indicated by the color red.

- **For voltage and waveforms. (CAM REC mode)**
- Voltage and waveform measuring conditions:*
  (1) Sample object: Pattern box color bars.*
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).*

1. Connection


2m
Φ Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

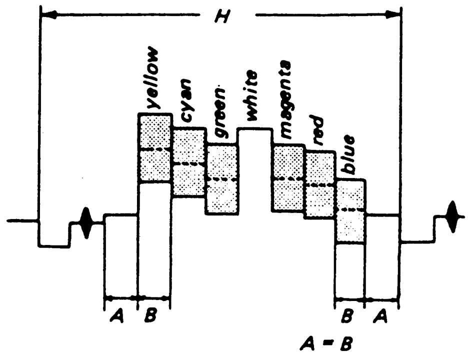

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Video output waveform.

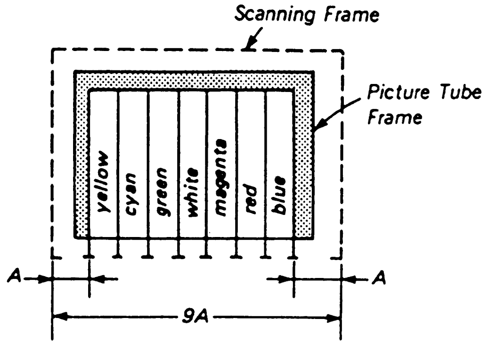
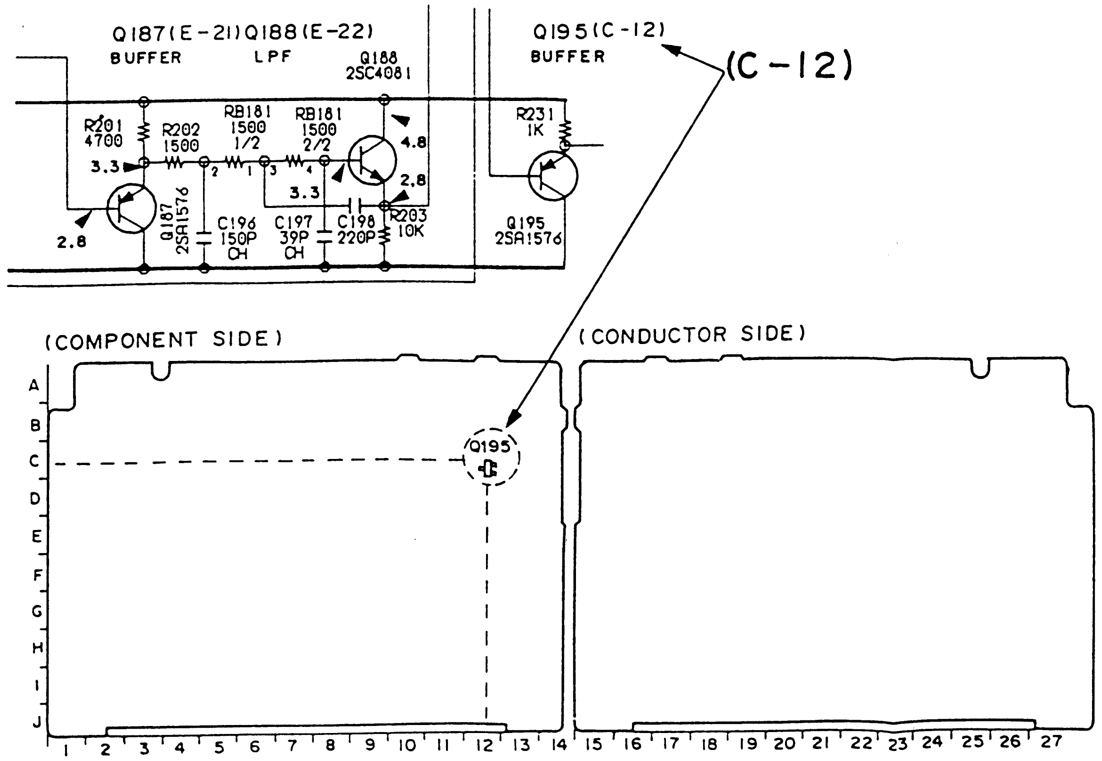

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

- **For voltage and waveforms. (REC/PB mode)**
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
3
4
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6
7
8
9
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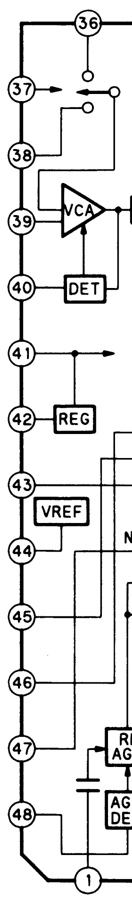
[Semiconductor for Correction List Display]

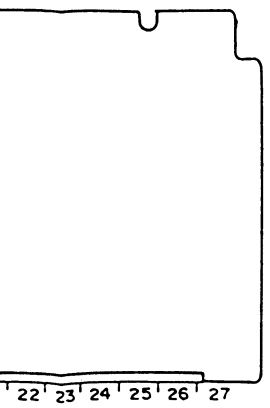
Part code and part name of the semiconductor for correction of the print board is described in the space of each print figure. Use this list when ordering parts.

• IC BLOC

VA-46


36
37
38
39
VCA
40
DET
41
42
REG
43
VREF
44
45
46
47
48
1

)



22
23
24
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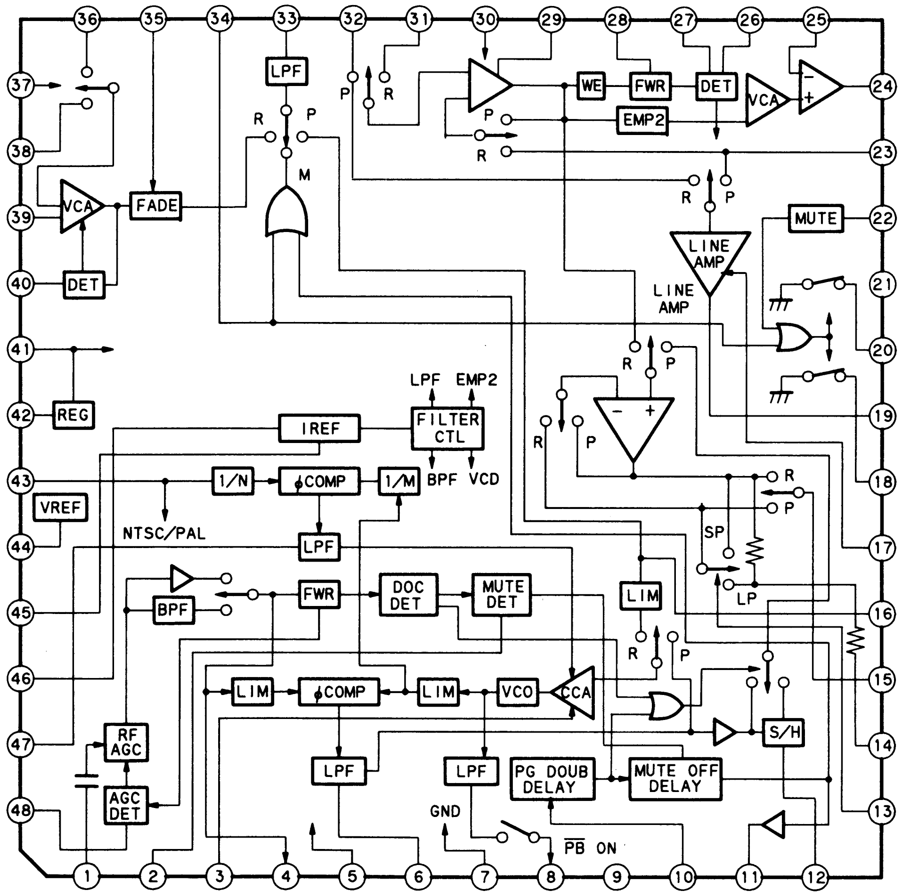
26
27

• IC BLOCK DIAGRAM

VA-46P BOARD IC400 CXA-1488R



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41
42
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45
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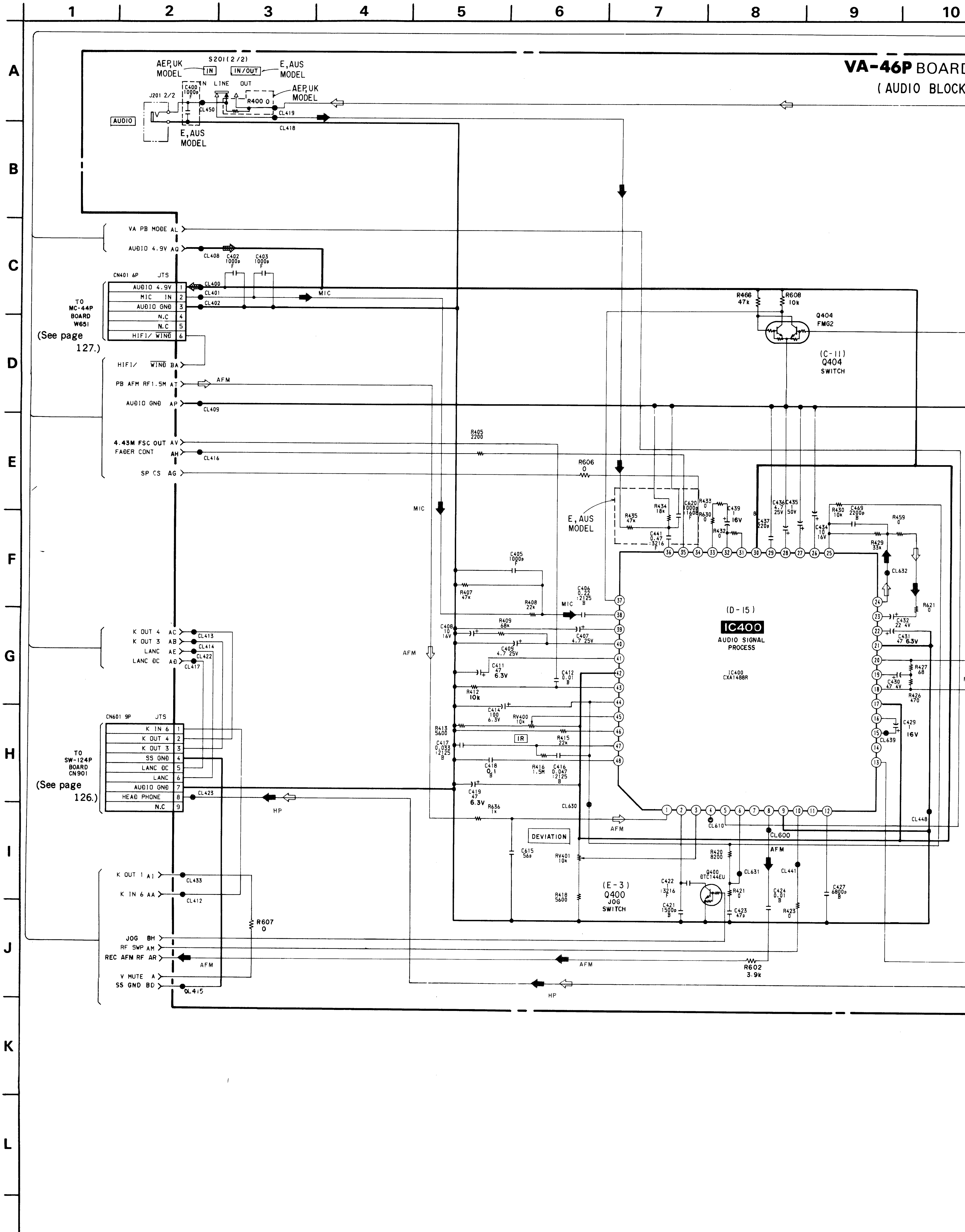
3
4
5
6
7
8
9
10
11
12
24
23
22
21
20
19
18
17
16
15
14
13
LPF
R
P
M
P
R
WE
FWR
DET
VCA
EMP2
P
R
R
P
VCA
FADE
DET
MUTE
LINE AMP
LINE AMP
R
P
REG
LPF
EMP2
FILTER CTL
IREF
1/N
ϕCOMP
1/M
BPF
VCD
VREF
NTSC/PAL
LPF
R
P
R
P
SP
LP
BPF
FWR
DOC DET
MUTE DET
LIM
R
P
LIM
ϕCOMP
LIM
VCO
CCA
S/H
RF AGC
AGC DET
LPF
LPF
PG DOUB DELAY
MUTE OFF DELAY
GND
PB ON

VA-46P (VIDEO/AUDIO) SCHEMATIC DIAGRAM

—Ref. No. VA-46P BOARD : 3000 series—


1
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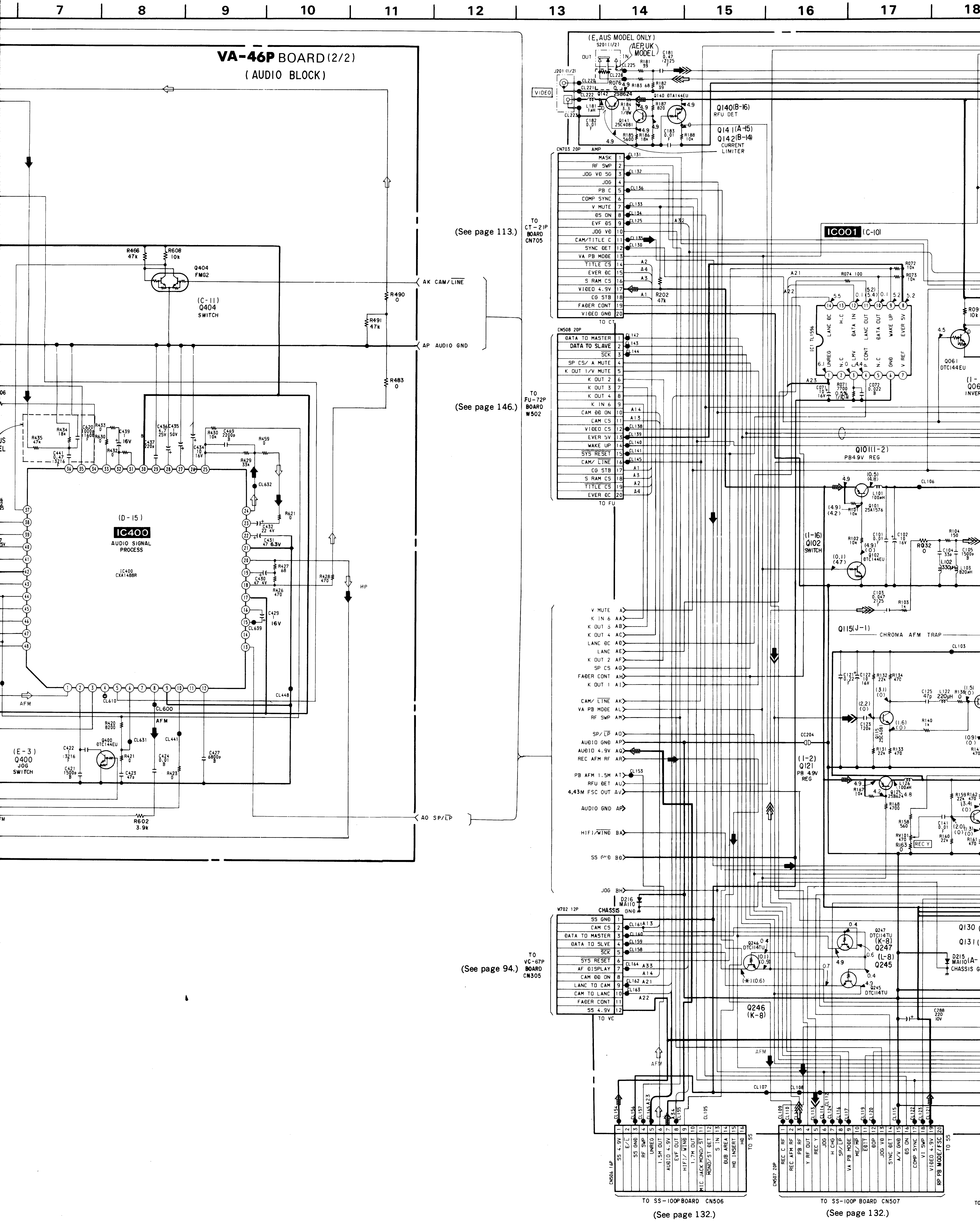
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
VA-46P BOARD
(AUDIO BLOCK
S201(2/2)
AEP,UK MODEL
IN
IN/OUT
E,AUS MODEL
LINE IN OUT
J201 2/2
AUDIO
C400 1000p
R400 0
CL450
CL419
CL418
VA PB MODE AL
AUDIO 4.9V AQ
CL408
C402 1000p
C403 1000p
CN401 6P JTS
AUDIO 4.9V
MIC IN
AUDIO GND
N.C
N.C
HIFI/ WIND
CL400
CL401
CL402
MIC
TO MC-44P BOARD W651
(See page 127.)
HIFI/ WIND BA
PB AFM RF1.5M AT
AFM
AUDIO GND AP
CL409
4.43M FSC OUT AV
FADER CONT AH
CL416
SP CS AG
R405 2200
R606 0
R466 47k
R608 10k
Q404 FMG2
(C-11) Q404 SWITCH
E,AUS MODEL
R434 18k
R435 47k
C441 0.47
C620 1000p
R630 0
R432
C439 1 16V
C437 220p
C436 4.7 25V
C435 1 50V
C434 10 16V
R430 10k
C469 2200p
R459 0
R429 33k
CL632
R621 0
C405 1000p
R407 47k
R408 22k
C406 0.22
C408 10 16V
R409 68k
C407 4.7 25V
C409 4.7 25V
C411 47 6.3V
C412 0.01
R412 10k
C414 100 6.3V
RV400 10k
R413 5600
C417 0.033
IR
R415 22k
C418 0.1
R416 1.5M
C416 0.047
C419 47 6.3V
R636 1k
CL630
(D-15)
IC400
AUDIO SIGNAL PROCESS
IC400 CXA1488R
C432 22 4V
C431 47 6.3V
R427 68
C430 47 4V
R426 470
C429 1 16V
CL639
CL448
K OUT 4 AC
K OUT 3 AB
LANC AE
LANC GND AD
CL413
CL414
CL422
CL417
CN601 9P JTS
K IN 6
K OUT 4
K OUT 3
SS GND
LANC DC
LANC
AUDIO GND
HEAD PHONE
N.C
CL423
HP
TO SW-124P BOARD CN901
(See page 126.)
DEVIATION
C615 56p
RV401 10k
AFM
CL610
CL600
R420 8200
Q400 DTC144EU
CL631
CL441
C422 1
C421 1500p
R421 0
C423 47p
C424 0.01
R423 0
C427 6800p
R418 5600
(E-3) Q400 JOG SWITCH
K OUT 1 AJ
K IN 6 AA
CL433
CL412
R607 0
JOG BH
RF SWP AM
REC AFM RF AR
V MUTE A
SS GND BD
CL415
R602 3.9k
AFM
HP

- In case of page reference, pay attention to the following.
  ( ) : Page for SERVICE MANUAL unit.

- **Signal path**

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨


7
8
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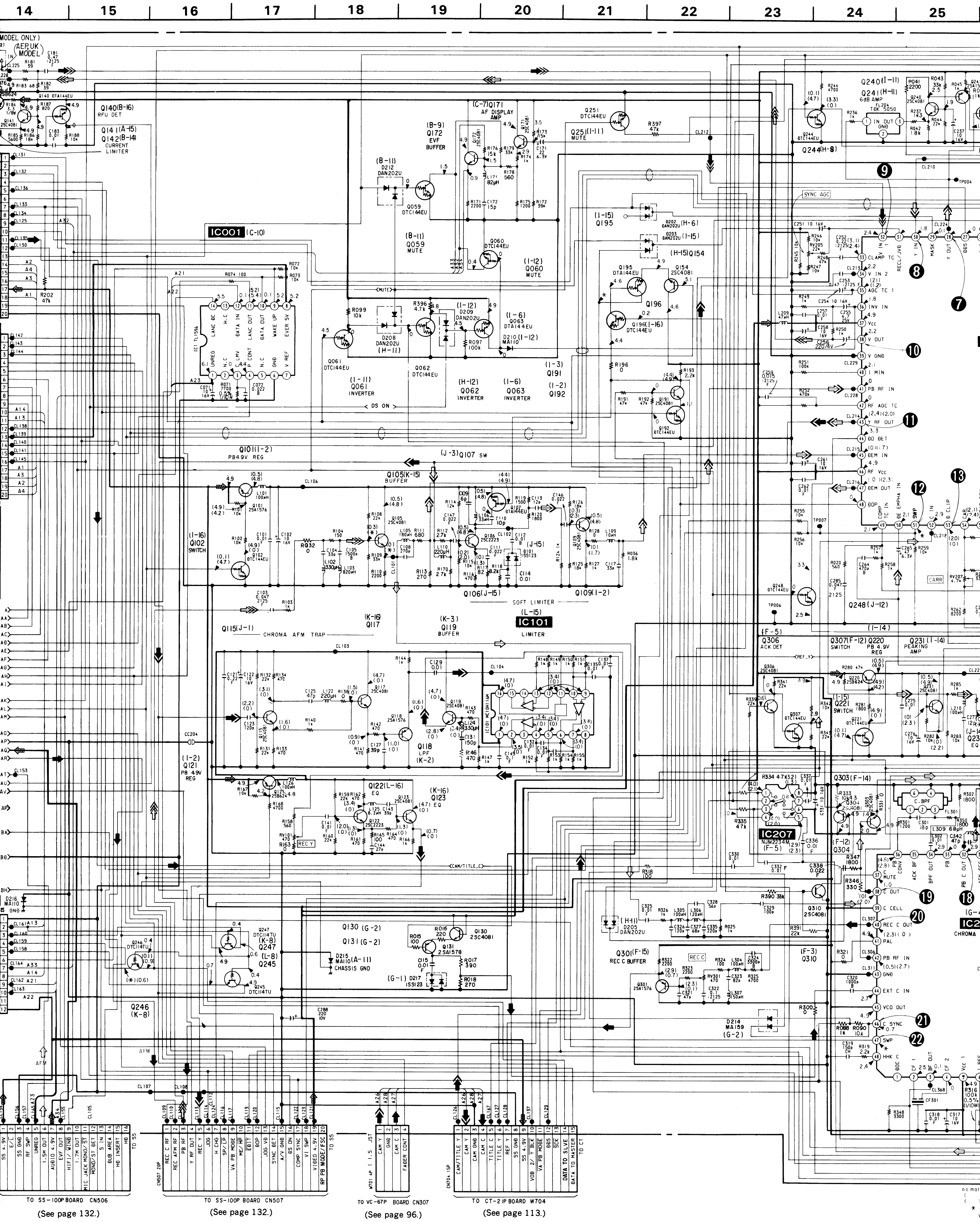
12
13
14
15
16
17
18
VA-46P BOARD (2/2)
(AUDIO BLOCK)
(E, AUS MODEL ONLY)
(AEP, UK MODEL)
VIDEO
Q140(B-16)
RFU DET
Q141(A-15)
Q142(B-14)
CURRENT LIMITER
CN703 20P AMP
MASK
RF SWP
JOG VD SG
JOG
PB C
COMP SYNC
V MUTE
DS ON
EVF DS
JOG VD
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER DC
S RAM CS
VIDEO 4.9V
CG STB
FADER CONT
VIDEO GND
TO CT
TO CT-21P BOARD CN705
(See page 113.)
IC001 (C-10)
IC1 TL1596
LANC DC
H.C
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVER 5V
UNREG
N.C
LMV
P CONT
N.C
GND
V REF
Q061 DTC144EU
Q404 FMG2
(C-11) Q404 SWITCH
AK CAM/LINE
AP AUDIO GND
CN508 20P
DATA TO MASTER
DATA TO SLAVE
SCK
SP CS/ A MUTE
K OUT 1/V MUTE
K OUT 2
K OUT 3
K OUT 4
K IN 6
CAM DD ON
CAM CS
VIDEO CS
EVER 5V
WAKE UP
SYS RESET
CAM/ LINE
CG STB
S RAM CS
TITLE CS
EVER DC
TO FU
TO FU-72P BOARD W502
(See page 146.)
Q101(I-2)
PB4.9V REG
(D-15)
IC400
AUDIO SIGNAL PROCESS
IC400 CXA1488R
HP
(I-16) Q102 SWITCH
Q115(J-1)
CHROMA AFM TRAP
V MUTE
K IN 6
K OUT 5
K OUT 4
LANC DC
LANC
K OUT 2
SP CS
FADER CONT
K OUT 1
CAM/ LINE
VA PB MODE
RF SWP
SP/LP
AUDIO GND
AUDIO 4.9V
REC AFM RF
PB AFM 1.5M
RFU DET
4.43M FSC OUT
AUDIO GND
HIFI/WIND
SS GND
JOG
D216 MA110
CHASSIS GND
AFM
CL600
(E-3) Q400 JOG SWITCH
Q400 DTC144EU
(I-2) Q121 PB 4.9V REG
AO SP/LP
R602 3.9k
W702 12P
SS GND
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
SYS RESET
AF DISPLAY
CAM DD ON
LANC TO CAM
CAM TO LANC
FADER CONT
SS 4.9V
TO VC
TO VC-67P BOARD CN305
(See page 94.)
Q246 DTC114TU
Q246 (K-8)
Q247 DTC114TU
(K-8) Q247
(L-8) Q245
Q245 DTC114TU
Q130
Q131
D215 MA110
CHASSIS GND
CN506 16P
SS 4.9V
E/L
SS GND
RF SWP
UNREG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI/WIND
1.7M OUT
MIC JACK MONO/ST IN
MONO/ST DET
S IN
DUB AREA
HD INSERT
HD IN
TO SS
TO SS-100P BOARD CN506
(See page 132.)
CN507 20P
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
H CHG
SP/LP
VA PB MODE
ME/MP
EDIT
BOP
JOG VD
A/V GND
DS ON
COMP SYNC
V1 SWP
VIDEO 4.9V
RP PB MODE/FSC
TO SS
TO SS-100P BOARD CN507
(See page 132.)


14
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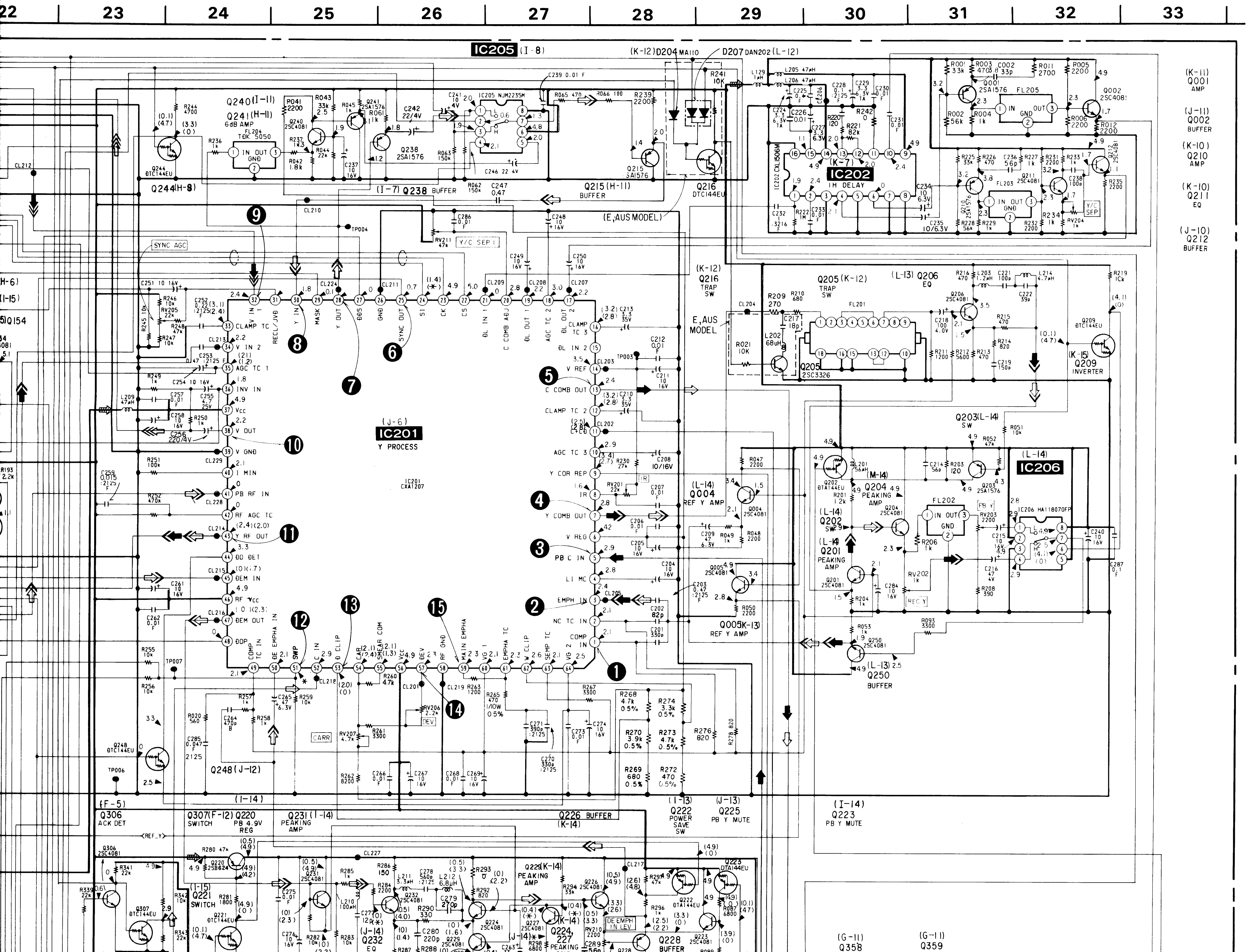
19
20
21
22
23
24
25
Q140(B-16) RFU DET
Q141(A-15) Q142(B-14) CURRENT LIMITER
(C-7)Q171 AF DISPLAY AMP
(B-9) Q172 EVF BUFFER
(B-11) D212 DAN202U
Q059 DTC144EU
(B-11) Q059 MUTE
Q060 DTC144EU
(I-12) Q060 MUTE
Q251 DTC144EU
Q251(I-11) MUTE
Q240(I-11) Q241(H-11) 6dB AMP
FL204 TDK 5050
Q244 DTC144EU
Q244(H-8)
IC001 (C-10)
IC1 TL1596
LANC DC
H.C
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVER 5V
UNREG
N.C
MV
P.CONT
GND
V.REF
(I-15) Q195
D202 DAN202U (H-6)
D203 DAN202U (I-15)
(H-15)Q154
Q195 DTA144EU
Q154 2SC4081
Q196
Q196(I-16) DTC144EU
R099 10k
R396 4.7k
(I-12) D209 DAN202U
(I-6) Q063 DTA144EU
D210(I-12) MA110
D208 DAN202U (H-11)
Q061 DTC144EU
Q062 DTC144EU
(I-11) Q061 INVERTER
(H-12) Q062 INVERTER
(I-6) Q063 INVERTER
(I-3) Q191
(I-2) Q192
Q191 2SC4081
Q192 DTC144EU
<MUTE>
DS ON
Q101(I-2) PB4.9V REG
(J-3)Q107 SW
Q105(K-15) BUFFER
Q101 2SA1576
(I-16) Q102 SWITCH
Q102 DTC144EU
Q105 2SC4081
Q106 2SC2223
Q107 DTA144EU
D101 1SS123
(J-15)
Q109 2SC4081
Q106(J-15)
SOFT LIMITER
Q109(I-2)
(L-15) IC101 LIMITER
(K-3) Q119 BUFFER
(K-16) Q117
Q115(J-1)
CHROMA AFM TRAP
CL103
CL104
IC101 MC10H116M
Q115 2SC4081
Q117 2SC4081
Q118 2SA1576
Q119 2SC4081
Q118 LPF (K-2)
(I-2) Q121 PB 4.9V REG
Q121 2SB624
Q122(L-16) EQ
(K-16) Q123 EQ
Q122 2SC2223
Q123 2SC4081
REC Y
RV101 470
<CAM/TITLE_C>
Q247 DTC114TU
Q246 DTC114TU
(K-8) Q247 (L-8) Q245
Q245 DTC114TU
Q246 (K-8)
D216 MA110
Q130 (G-2)
Q131 (G-2)
Q130 2SC4081
Q131 2SA1576
D215 MA110(A-11) CHASSIS GND
(G-1) D217 1SS123
C288 220 10V
AFM
D205 DAN202U (H-11)
Q301(F-15) REC C BUFFER
REC C
Q301 2SA1576
RV301 470
D214 MA159 (G-2)
(F-3) Q310
Q310 2SC4081
(F-5) Q306 ACK DET
<REF_Y>
Q306 2SC4081
Q307(F-12) SWITCH
Q220 PB 4.9V REG
Q231 (I-14) PEAKING AMP
Q220 2SB624
(I-15) Q221 SWITCH
Q221 DTC144EU
Q307 DTC144EU
IC207 NJM2234M (F-5)
Q303(F-14)
C.BPF
FL301
(F-12) Q304
Q248 DTC144EU
Q248(J-12)
SYNC AGC
CARR
CF301
32 V IN 1
33 CLAMP TC
34 V IN 2
35 AGC TC 1
36 INV IN
37 Vcc
38 V OUT
39 V GND
40 I MIN
41 PB RF IN
42 RF AGC TC
43 Y RF OUT
44 DO DET
45 DEM IN
46 RF Vcc
47 DEM OUT
48 DOP
49 COMP TC IN
50 DE EMPHA IN
51 SWP
52 C CLIP
RECL/JVO
Y IN
MASK
Y OUT
DDS
36 PB CONV
35 ACK BF
34 BPF OUT
33 PB C OUT
37 C MUTE
38 C OUT
39 C CELL
40 REC C OUT
41 PAL
42 PB RF IN
43 GND
44 EXT C IN
45 VCO OUT
46 C SYNC
47 SWP
48 HHK C
DOC C
CF 1
CF 2
Vcc 1
CHROMA
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑱
⑲
⑳
㉑
㉒
SS 4.9V
E/L
SS GND
RF SWP
UNREG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI/I.7M WIND
MIC JACK MONO/ST
MONO/ST DET
S IN
SUB AREA
HD INSERT
HD
TO SS
TO SS-100P BOARD CN506
(See page 132.)
CN507 20P
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
H CHG
SP/LP
VA PB MODE
ME/MP
EDIT
DOP
JOG VO
SYNC DET
A/V GND
DS ON
COMP SYNC
VI SWP
VIDEO 4.9V
RP PB MODE/FSC
TO SS
TO SS-100P BOARD CN507
(See page 132.)
W701 4P 1.5 JST
CAM Y
GND
CAM C
FADER CONT
TO VC-67P BOARD CN307
(See page 96.)
CN704 15P
CAM/TITLE Y
CAM C
CAM GND
TITLE C
TITLE Y
REF Y
SS GND
SS 4.9V
VDB 2/ Y BLK
VA PB MODE
DDS
SCK
DATA TO SLVE
DATA TO MASTER
TO CT
TO CT-21P BOARD W704
(See page 113.)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IC205 (I-8)
IC201
Y PROCESS
IC202
1H DELAY
IC206
IC203
CHROMA PROCESS
IC207
IC204
JOG CHROMA PROCESS
Q001 AMP
Q002 BUFFER
Q210 AMP
Q211 EQ
Q212 BUFFER
Q216 TRAP SW
Q205 TRAP SW
Q206 EQ
Q209 INVERTER
Q203 SW
Q004 REF Y AMP
Q202 SW
Q201 PEAKING AMP
Q204 PEAKING AMP
Q005 REF Y AMP
Q250 BUFFER
Q240 Q241 6dB AMP
Q244
Q238 BUFFER
Q215 BUFFER
Q216
Q248
Q222 POWER SAVE SW
Q225 PB Y MUTE
Q223 PB Y MUTE
Q306 ACK DET
Q307 SWITCH
Q220 PB 4.9V REG
Q231 PEAKING AMP
Q226 BUFFER
Q221 SWITCH
Q232 EQ
Q224, 227 PEAKING AMP
Q228 BUFFER
Q358 INVERTER
Q359
Q311
Q303
Q304
Q310
Q362 INVERTER
Q360 MUTE
Q357 SWITCH
Q356 SWITCH
Q354 BUFFER
Q351 BUFFER
Q352 BUFFER
Q353 BUFFER
D204 MA110
D207 DAN202
D214 MA159
D351 MA110
(E, AUS MODEL)
E, AUS MODEL
VA-46P BOARD (1/2) VIDEO BLOCK

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
* : Impossible to measure the voltage at the marked points.

SECTION 2
ELECTRICAL PARTS LIST

VA-46P

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- CAPACITORS
  uF: μF
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD....

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	* A-7062-557-A	VA-46P BOARD, COMPLETE (AEP, UK)			
		**********************			
	* A-7062-558-A	VA-46P BOARD, COMPLETE (E, AUS)			
		**********************			
		(Ref. No 3,000 Series)			
	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD			
	* 3-744-816-01	CASE (MAIN), SHIELD, VA			
	* 3-744-817-01	CASE (BOTTOM), SHIELD, VA			
		< CAPACITOR >			
C002	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C071	1-128-004-11	ELECT CHIP	10uF	20%	16V
C072	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C101	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C102	1-128-004-11	ELECT CHIP	10uF	20%	16V
C103	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C104	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C105	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C109	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C110	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C111	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C113	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C115	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C117	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C121	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C122	1-128-004-11	ELECT CHIP	10uF	20%	16V
C123	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C125	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C127	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C129	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C131	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C132	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C134	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C135	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C137	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C141	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C143	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C144	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C145	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C146	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C147	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C171	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C172	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C181	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C182	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C183	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C200	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C202	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V
C209	1-126-154-11	ELECT	47uF	20%	6.3V
C210	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V
C212	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C213	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C214	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V
C216	1-126-607-11	ELECT CHIP	47uF	20%	4V
C217	1-162-944-11	CERAMIC CHIP	18PF	5%	50V (E, AUS)
C218	1-126-209-11	ELECT CHIP	100uF	20%	4V

Ref. No.	Part No.	Description			Remark
C219	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C221	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C222	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C224	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C225	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C226	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C227	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C228	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C229	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C230	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C231	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C232	1-162-638-11	CERAMIC CHIP	1uF		16V
C233	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C234	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C235	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C236	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C237	1-128-004-11	ELECT CHIP	10uF	20%	16V
C238	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C239	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C241	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C242	1-128-003-11	ELECT CHIP	22uF	20%	4V
C246	1-128-003-11	ELECT CHIP	22uF	20%	4V
C247	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C248	1-128-004-11	ELECT CHIP	10uF	20%	16V
C249	1-128-004-11	ELECT CHIP	10uF	20%	16V
C250	1-128-004-11	ELECT CHIP	10uF	20%	16V
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C252	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C253	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C254	1-128-004-11	ELECT CHIP	10uF	20%	16V
C255	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C256	1-126-246-11	ELECT CHIP	220uF	20%	4V
C257	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C258	1-128-004-11	ELECT CHIP	10uF	20%	16V
C259	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C261	1-124-779-00	ELECT CHIP	10uF	20%	16v
C262	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C263	1-126-207-11	ELECT CHIP	33uF	20%	4V
C264	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C265	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C266	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C267	1-124-779-00	ELECT CHIP	10uF	20%	16v
C268	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C269	1-128-004-11	ELECT CHIP	10uF	20%	16V
C270	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C271	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C273	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C274	1-128-004-11	ELECT CHIP	10uF	20%	16V
C275	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C276	1-128-004-11	ELECT CHIP	10uF	20%	16V
C277	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C278	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C279	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C280	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C284	1-128-004-11	ELECT CHIP	10uF	20%	16V
C285	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C286	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C287	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C288	1-126-176-11	ELECT	220uF	20%	10V
C289	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C301	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C305	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C306	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C307	1-128-004-11	ELECT CHIP	10uF	20%	16V
C308	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C309	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V
C311	1-128-013-11	ELECT CHIP	1uF	20%	50V
C312	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-128-004-11	ELECT CHIP	10uF	20%	16V
C317	1-128-004-11	ELECT CHIP	10uF	20%	16V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-217-11	CERAMIC CHIP	150PF	0.25PF	50V
C320	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C321	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C322	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C323	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C324	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C325	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C326	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C327	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C328	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C329	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C330	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C331	1-128-004-11	ELECT CHIP	10uF	20%	16V
C332	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C333	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C334	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C335	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C336	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C337	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C338	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C339	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C340	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C342	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C352	1-128-013-11	ELECT CHIP	1uF	20%	50V
C353	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C354	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C355	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C357	1-128-004-11	ELECT CHIP	10uF	20%	16V
C358	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C359	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C360	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C361	1-128-007-11	ELECT CHIP	2.2uF	20%	35V
C362	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C363	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C365	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C366	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C368	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C370	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C371	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C400	1-162-971-11	CERAMIC CHIP	0.001uF	50V	(E. AUS)
C402	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C403	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C405	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C406	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C407	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C408	1-124-779-00	ELECT CHIP	10uF	20%	16v
C409	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C411	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C416	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C417	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C418	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C419	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C421	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C422	1-162-638-11	CERAMIC CHIP	1uF		16V
C423	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C424	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C427	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C429	1-162-638-11	CERAMIC CHIP	1uF		16V
C430	1-126-607-11	ELECT CHIP	47uF	20%	4V
C431	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C432	1-128-003-11	ELECT CHIP	22uF	20%	4V
C434	1-128-004-11	ELECT CHIP	10uF	20%	16V
C435	1-128-013-11	ELECT CHIP	1uF	20%	50V
C436	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C437	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C439	1-162-638-11	CERAMIC CHIP	1uF		16V
C441	1-162-637-11	CERAMIC CHIP	0.47uF	16V	(E. AUS)
C469	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C615	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C620	1-162-971-11	CERAMIC CHIP	0.001uF	50V	(E. AUS)

< FILTER >

Ref. No.	Part No.	Description
CF301	1-577-162-11	FILTER, CERAMIC

< CONNECTOR >

Ref. No.	Part No.	Description
CN401	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P
CN506	1-569-486-11	CONNECTOR, BOARD TO BOARD 16P
CN507	1-569-485-11	CONNECTOR, BOARD TO BOARD 20P
CN508	1-569-478-21	CONNECTOR, FPC 20P
CN601	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P
CN703	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P
CN704	1-569-363-21	CONNECTOR, FPC 15P

< DIODE >

Ref. No.	Part No.	Description		Remark
D101	8-719-800-76	DIODE	1SS226	
D202	8-719-941-86	DIODE	DAN202U	
D203	8-719-941-86	DIODE	DAN202U	
D204	8-719-404-46	DIODE	MA110	(E. AUS)
D205	8-719-941-86	DIODE	DAN202U	
D207	8-719-941-86	DIODE	DAN202U	(E. AUS)
D208	8-719-941-86	DIODE	DAN202U	
D209	8-719-941-86	DIODE	DAN202U	
D210	8-719-404-46	DIODE	MA110	
D212	8-719-941-86	DIODE	DAN202U	
D214	8-719-940-45	DIODE	MA159	
D215	8-719-404-46	DIODE	MA110	
D216	8-719-404-46	DIODE	MA110	
D217	8-719-800-76	DIODE	1SS226	
D351	8-719-404-46	DIODE	MA110	

< FILTER >

Ref. No.	Part No.	Description
FL201	1-236-751-21	FILTER, LOW PASS
FL202	1-415-764-21	DELAY LINE, LC
FL203	1-236-848-21	FILTER, LOW PASS
FL204	1-415-729-21	DELAY LINE, LC (Y)
FL205	1-236-952-21	LOWPASS FILTER (CCD, PAL. Y)
FL301	1-236-849-21	FILTER, BAND PASS
FL302	1-236-186-11	FILTER, BAND PASS
FL303	1-236-850-21	FILTER, BAND PASS

< IC >

Ref. No.	Part No.	Description	
IC001	8-759-999-02	IC	TL1596CDSB
IC101	8-759-012-00	IC	MC10H116M
IC201	8-752-036-19	IC	CXA1207R
IC202	8-752-335-88	IC	CXL1506M

VA-46P

Ref. No.	Part No.	Description	Remark
IC203	8-752-036-20	IC CXA1208R	
IC204	8-759-605-61	IC CXA1203N	
IC205	8-759-710-29	IC NJM2235M	
IC206	8-759-320-76	IC HA118070FP	
IC207	8-759-710-07	IC NJM2234M	
IC400	8-759-823-19	IC CXA1488R	

< COIL >

Ref. No.	Part No.	Description	Remark
L101	1-412-032-11	INDUCTOR CHIP 100uH	
L102	1-412-280-31	INDUCTOR 330uH	
L103	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L106	1-410-387-11	INDUCTOR CHIP 33uH	
L109	1-410-381-11	INDUCTOR CHIP 10uH (E, AUS)	
L110	1-410-658-31	INDUCTOR CHIP 220uH	
L122	1-410-658-31	INDUCTOR CHIP 220uH	
L124	1-412-280-31	INDUCTOR 330uH	
L125	1-410-380-31	INDUCTOR CHIP 8.2uH	
L126	1-412-032-11	INDUCTOR CHIP 100uH	
L129	1-412-026-11	INDUCTOR CHIP 1uH	
L171	1-410-392-11	INDUCTOR CHIP 82uH	
L201	1-410-390-11	INDUCTOR CHIP 56uH	
L202	1-410-391-11	INDUCTOR CHIP 68uH (E, AUS)	
L203	1-410-370-31	INDUCTOR CHIP 1.2uH	
L205	1-412-031-11	INDUCTOR CHIP 47uH	
L209	1-412-031-11	INDUCTOR CHIP 47uH	
L210	1-410-393-11	INDUCTOR CHIP 100uH	
L211	1-410-375-11	INDUCTOR CHIP 3.3uH	
L212	1-410-379-21	INDUCTOR CHIP 6.8uH	
L214	1-410-377-31	INDUCTOR CHIP 4.7uH	
L301	1-410-393-11	INDUCTOR CHIP 100uH	
L302	1-410-386-11	INDUCTOR CHIP 27uH	
L304	1-410-393-11	INDUCTOR CHIP 100uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L309	1-410-379-21	INDUCTOR CHIP 6.8uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-905-23	TRANSISTOR 2SA1576-R	
Q002	8-729-905-35	TRANSISTOR 2SC4081-R	
Q004	8-729-905-35	TRANSISTOR 2SC4081-R	
Q005	8-729-905-35	TRANSISTOR 2SC4081-R	
Q059	8-729-905-18	TRANSISTOR DTC144EU	
Q060	8-729-905-18	TRANSISTOR DTC144EU	
Q061	8-729-905-18	TRANSISTOR DTC144EU	
Q062	8-729-905-18	TRANSISTOR DTC144EU	
Q063	8-729-905-12	TRANSISTOR DTA144EU	
Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-905-18	TRANSISTOR DTC144EU	
Q105	8-729-905-35	TRANSISTOR 2SC4081-R	
Q106	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q107	8-729-905-12	TRANSISTOR DTA144EU	
Q109	8-729-905-35	TRANSISTOR 2SC4081-R	
Q115	8-729-905-35	TRANSISTOR 2SC4081-R	
Q117	8-729-905-35	TRANSISTOR 2SC4081-R	
Q118	8-729-905-23	TRANSISTOR 2SA1576-R	
Q119	8-729-905-35	TRANSISTOR 2SC4081-R	
Q121	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q122	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q123	8-729-905-35	TRANSISTOR 2SC4081-R	
Q130	8-729-905-35	TRANSISTOR 2SC4081-R	
Q131	8-729-905-23	TRANSISTOR 2SA1576-R	
Q140	8-729-905-12	TRANSISTOR DTA144EU	
Q141	8-729-905-35	TRANSISTOR 2SC4081-R	
Q142	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q154	8-729-905-35	TRANSISTOR 2SC4081-R	
Q171	8-729-905-35	TRANSISTOR 2SC4081-R	
Q172	8-729-905-35	TRANSISTOR 2SC4081-R	
Q191	8-729-905-35	TRANSISTOR 2SC4081-R	
Q192	8-729-905-18	TRANSISTOR DTC144EU	
Q195	8-729-905-12	TRANSISTOR DTA144EU	
Q196	8-729-905-18	TRANSISTOR DTC144EU	
Q201	8-729-905-35	TRANSISTOR 2SC4081-R	
Q202	8-729-905-12	TRANSISTOR DTA144EU	
Q203	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-905-35	TRANSISTOR 2SC4081-R	
Q205	8-729-100-66	TRANSISTOR 2SC1623 (E, AUS)	
Q206	8-729-905-35	TRANSISTOR 2SC4081-R	
Q209	8-729-905-18	TRANSISTOR DTC144EU	
Q210	8-729-905-23	TRANSISTOR 2SA1576-R	
Q211	8-729-905-35	TRANSISTOR 2SC4081-R	
Q212	8-729-905-35	TRANSISTOR 2SC4081-R	
Q215	8-729-905-23	TRANSISTOR 2SA1576-R	
Q216	8-729-905-18	TRANSISTOR DTC144EU (E, AUS)	
Q220	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q221	8-729-905-18	TRANSISTOR DTC144EU	
Q222	8-729-905-12	TRANSISTOR DTA144EU	
Q223	8-729-905-35	TRANSISTOR 2SC4081-R	
Q224	8-729-905-35	TRANSISTOR 2SC4081-R	
Q225	8-729-905-12	TRANSISTOR DTA144EU	
Q226	8-729-905-35	TRANSISTOR 2SC4081-R	
Q227	8-729-905-35	TRANSISTOR 2SC4081-R	
Q228	8-729-905-23	TRANSISTOR 2SA1576-R	
Q229	8-729-905-35	TRANSISTOR 2SC4081-R	
Q231	8-729-905-35	TRANSISTOR 2SC4081-R	
Q232	8-729-905-35	TRANSISTOR 2SC4081-R	
Q238	8-729-905-23	TRANSISTOR 2SA1576-R	

Ref. No.	Part No.	Description				Remark
Q240	8-729-905-35	TRANSISTOR	2SC4081-R			
Q241	8-729-905-23	TRANSISTOR	2SA1576-R			
Q243	8-729-905-18	TRANSISTOR	DTC144EU			
Q244	8-729-905-18	TRANSISTOR	DTC144EU			
Q245	8-729-905-XX	TRANSISTOR	DTC114TU			
Q246	8-729-905-XX	TRANSISTOR	DTC114TU			
Q247	8-729-905-XX	TRANSISTOR	DTC114TU			
Q248	8-729-905-18	TRANSISTOR	DTC144EU			
Q250	8-729-905-35	TRANSISTOR	2SC4081-R			
Q251	8-729-905-18	TRANSISTOR	DTC144EU			
Q301	8-729-905-23	TRANSISTOR	2SA1576-R			
Q303	8-729-905-35	TRANSISTOR	2SC4081-R			
Q304	8-729-905-35	TRANSISTOR	2SC4081-R			
Q306	8-729-905-35	TRANSISTOR	2SC4081-R			
Q307	8-729-905-18	TRANSISTOR	DTC144EU			
Q310	8-729-905-35	TRANSISTOR	2SC4081-R			
Q311	8-729-905-35	TRANSISTOR	2SC4081-R			
Q351	8-729-905-35	TRANSISTOR	2SC4081-R			
Q352	8-729-905-35	TRANSISTOR	2SC4081-R			
Q353	8-729-905-35	TRANSISTOR	2SC4081-R			
Q354	8-729-905-35	TRANSISTOR	2SC4081-R			
Q356	8-729-905-18	TRANSISTOR	DTC144EU			
Q357	8-729-905-12	TRANSISTOR	DTA144EU			
Q358	8-729-905-18	TRANSISTOR	DTC144EU			
Q359	8-729-102-08	TRANSISTOR	2SC2223-F14			
Q360	8-729-905-18	TRANSISTOR	DTC144EU			
Q362	8-729-905-18	TRANSISTOR	DTC144EU			
Q400	8-729-905-18	TRANSISTOR	DTC144EU			
Q404	8-729-904-07	TRANSISTOR	FMG2			
		< RESISTOR >				
R001	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R002	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R003	1-216-817-11	METAL CHIP	470	5%	1/16W	
R004	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R005	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R006	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R011	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R012	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R015	1-216-809-11	METAL CHIP	100	5%	1/16W	
R016	1-216-813-11	METAL CHIP	220	5%	1/16W	
R017	1-216-816-11	METAL CHIP	390	5%	1/16W	
R018	1-216-814-11	METAL CHIP	270	5%	1/16W	
R020	1-216-818-11	METAL CHIP	560	5%	1/16W	
R021	1-216-864-11	METAL CHIP	0	5%	1/16W	(E. AUS)
R025	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R032	1-216-864-11	METAL CHIP	0	5%	1/16W	
R036	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R041	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R042	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R043	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R044	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R045	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R047	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R048	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R049	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R050	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R053	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R061	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R062	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R063	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R065	1-216-817-11	METAL CHIP	470	5%	1/16W	
R066	1-216-809-11	METAL CHIP	100	5%	1/16W	
R071	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W	
R072	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R073	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R074	1-216-809-11	METAL CHIP	100	5%	1/16W	
R076	1-216-864-11	METAL CHIP	0	5%	1/16W	(AEP, UK)
R087	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R088	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R089	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R090	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R093	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R097	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R099	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R101	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R102	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R103	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R104	1-216-811-11	METAL CHIP	150	5%	1/16W	
R108	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R109	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R110	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R111	1-216-819-11	METAL CHIP	680	5%	1/16W	
R112	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R113	1-216-814-11	METAL CHIP	270	5%	1/16W	
R114	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R116	1-216-817-11	METAL CHIP	470	5%	1/16W	
R117	1-216-808-11	METAL CHIP	82	5%	1/16W	
R118	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R119	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R120	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R124	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R125	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R126	1-216-836-11	METAL CHIP	18K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R127	1-216-821-11	METAL CHIP	1K	5%	1/16W
R128	1-216-864-11	METAL CHIP	0	5%	1/16W
R131	1-216-837-11	METAL CHIP	22K	5%	1/16W
R132	1-216-837-11	METAL CHIP	22K	5%	1/16W
R133	1-216-817-11	METAL CHIP	470	5%	1/16W
R134	1-216-817-11	METAL CHIP	470	5%	1/16W
R138	1-216-864-11	METAL CHIP	0	5%	1/16W
R140	1-216-821-11	METAL CHIP	1K	5%	1/16W
R141	1-216-817-11	METAL CHIP	470	5%	1/16W
R142	1-216-817-11	METAL CHIP	470	5%	1/16W
R143	1-216-817-11	METAL CHIP	470	5%	1/16W
R144	1-216-821-11	METAL CHIP	1K	5%	1/16W
R145	1-216-295-00	METAL CHIP	0	5%	1/10W
R146	1-216-817-11	METAL CHIP	470	5%	1/16W
R147	1-216-821-11	METAL CHIP	1K	5%	1/16W
R148	1-216-821-11	METAL CHIP	1K	5%	1/16W
R149	1-216-821-11	METAL CHIP	1K	5%	1/16W
R150	1-216-821-11	METAL CHIP	1K	5%	1/16W
R151	1-216-821-11	METAL CHIP	1K	5%	1/16W
R152	1-216-821-11	METAL CHIP	1K	5%	1/16W
R153	1-216-821-11	METAL CHIP	1K	5%	1/16W
R154	1-216-821-11	METAL CHIP	1K	5%	1/16W
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W
R158	1-216-818-11	METAL CHIP	560	5%	1/16W
R159	1-216-837-11	METAL CHIP	22K	5%	1/16W
R160	1-216-837-11	METAL CHIP	22K	5%	1/16W
R161	1-216-817-11	METAL CHIP	470	5%	1/16W
R162	1-216-817-11	METAL CHIP	470	5%	1/16W
R163	1-216-864-11	METAL CHIP	0	5%	1/16W
R164	1-216-817-11	METAL CHIP	470	5%	1/16W
R165	1-216-809-11	METAL CHIP	100	5%	1/16W
R166	1-216-821-11	METAL CHIP	1K	5%	1/16W
R167	1-216-833-11	METAL CHIP	10K	5%	1/16W
R168	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R170	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R171	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R172	1-216-840-11	METAL CHIP	39K	5%	1/16W
R173	1-216-835-11	METAL CHIP	15K	5%	1/16W
R174	1-216-821-11	METAL CHIP	1K	5%	1/16W
R175	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R176	1-216-835-11	METAL CHIP	15K	5%	1/16W
R177	1-216-295-00	METAL CHIP	0	5%	1/10W
R178	1-216-818-11	METAL CHIP	560	5%	1/16W
R179	1-216-839-11	METAL CHIP	33K	5%	1/16W
R181	1-216-804-11	METAL CHIP	39	5%	1/16W
R182	1-216-804-11	METAL CHIP	39	5%	1/16W
R183	1-216-807-11	METAL CHIP	68	5%	1/16W
R184	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R185	1-216-830-11	METAL CHIP	5.6K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R186	1-216-836-11	METAL CHIP	18K	5%	1/16W
R187	1-216-820-11	METAL CHIP	820	5%	1/16W
R188	1-216-833-11	METAL CHIP	10K	5%	1/16W
R191	1-216-841-11	METAL CHIP	47K	5%	1/16W
R192	1-216-841-11	METAL CHIP	47K	5%	1/16W
R193	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R196	1-216-864-11	METAL CHIP	0	5%	1/16W
R201	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-810-11	METAL CHIP	120	5%	1/16W
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R208	1-216-816-11	METAL CHIP	390	5%	1/16W
R209	1-216-814-11	METAL CHIP	270	5%	1/16W
R210	1-216-819-11	METAL CHIP	680	5%	1/16W
R211	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R212	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R213	1-216-817-11	METAL CHIP	470	5%	1/16W
R214	1-216-820-11	METAL CHIP	820	5%	1/16W
R215	1-216-817-11	METAL CHIP	470	5%	1/16W
R216	1-216-817-11	METAL CHIP	470	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-810-11	METAL CHIP	120	5%	1/16W
R221	1-216-844-11	METAL CHIP	82K	5%	1/16W
R222	1-216-857-11	METAL CHIP	1M	5%	1/16W
R225	1-216-839-11	METAL CHIP	33K	5%	1/16W
R226	1-216-817-11	METAL CHIP	470	5%	1/16W
R227	1-216-049-00	METAL CHIP	1K	5%	1/10W
R228	1-216-842-11	METAL CHIP	56K	5%	1/16W
R229	1-216-821-11	METAL CHIP	1K	5%	1/16W
R230	1-216-838-11	METAL CHIP	27K	5%	1/16W
R231	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R232	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R233	1-216-821-11	METAL CHIP	1K	5%	1/16W
R234	1-216-821-11	METAL CHIP	1K	5%	1/16W
R235	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R236	1-216-821-11	METAL CHIP	1K	5%	1/16W
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W
R239	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W (E. AUS)
R242	1-216-864-11	METAL CHIP	0	5%	1/16W
R244	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R245	1-216-833-11	METAL CHIP	10K	5%	1/16W
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-841-11	METAL CHIP	47K	5%	1/16W
R249	1-216-821-11	METAL CHIP	1K	5%	1/16W
R250	1-216-821-11	METAL CHIP	1K	5%	1/16W
R251	1-216-845-11	METAL CHIP	100K	5%	1/16W

Ref. No.	Part No.	Description				Remark
R252	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R258	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R260	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R261	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R262	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R263	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R265	1-216-643-11	METAL CHIP	470	0.5%	1/10W	
R267	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R268	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R269	1-218-688-11	METAL CHIP	680	0.50%	1/16W	
R270	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W	
R272	1-216-817-11	METAL CHIP	470	5%	1/16W	
R273	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R274	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W	
R276	1-216-820-11	METAL CHIP	820	5%	1/16W	
R278	1-216-820-11	METAL CHIP	820	5%	1/16W	
R280	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R281	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R282	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R283	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R284	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R286	1-216-811-11	METAL CHIP	150	5%	1/16W	
R287	1-216-813-11	METAL CHIP	220	5%	1/16W	
R288	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R290	1-216-815-11	METAL CHIP	330	5%	1/16W	
R291	1-216-815-11	METAL CHIP	330	5%	1/16W	
R292	1-216-820-11	METAL CHIP	820	5%	1/16W	
R293	1-216-864-11	METAL CHIP	0	5%	1/16W	
R294	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R296	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R297	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R298	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R300	1-216-864-11	METAL CHIP	0	5%	1/16W	
R301	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R302	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R303	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R304	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R305	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R308	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R309	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R310	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R311	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R312	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R314	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R315	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R316	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R318	1-216-809-11	METAL CHIP	100	5%	1/16W	
R319	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R321	1-216-864-11	METAL CHIP	0	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R324	1-216-809-11	METAL CHIP	100	5%	1/16W	
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R331	1-216-864-11	METAL CHIP	0	5%	1/16W	
R332	1-216-817-11	METAL CHIP	470	5%	1/16W	
R333	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R334	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R339	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R341	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R342	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R343	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R346	1-216-815-11	METAL CHIP	330	5%	1/16W	
R347	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R348	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R350	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R351	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R352	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R353	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R354	1-216-864-11	METAL CHIP	0	5%	1/16W	
R355	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R356	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R357	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R358	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R359	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R360	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R361	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R362	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R364	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R365	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R366	1-216-817-11	METAL CHIP	470	5%	1/16W	
R367	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R368	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R369	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R370	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R371	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R372	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R373	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R374	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R375	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R376	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R389	1-216-190-00	METAL GLAZE 470 5% 1/8W	
R390	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R391	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R392	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R393	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R394	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R395	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R396	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R397	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R398	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R400	1-216-864-11	METAL CHIP 0 5% 1/16W	(AEP, UK)
R405	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R407	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R408	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R409	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R412	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R413	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R415	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R416	1-216-859-11	METAL GLAZE 1.5M 5% 1/16W	
R418	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R420	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R421	1-216-864-11	METAL CHIP 0 5% 1/16W	
R423	1-216-864-11	METAL CHIP 0 5% 1/16W	
R426	1-216-817-11	METAL CHIP 470 5% 1/16W	
R427	1-216-807-11	METAL CHIP 68 5% 1/16W	
R428	1-216-817-11	METAL CHIP 470 5% 1/16W	
R429	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R430	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R432	1-216-864-11	METAL CHIP 0 5% 1/16W	
R433	1-216-864-11	METAL CHIP 0 5% 1/16W	
R434	1-216-836-11	METAL CHIP 18K 5% 1/16W	(E, AUS)
R435	1-216-841-11	METAL CHIP 47K 5% 1/16W	(E, AUS)
R459	1-216-864-11	METAL CHIP 0 5% 1/16W	
R466	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R483	1-216-864-11	METAL CHIP 0 5% 1/16W	
R490	1-216-864-11	METAL CHIP 0 5% 1/16W	
R491	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R602	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R606	1-216-864-11	METAL CHIP 0 5% 1/16W	
R607	1-216-864-11	METAL CHIP 0 5% 1/16W	
R608	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R621	1-216-864-11	METAL CHIP 0 5% 1/16W	
R630	1-216-864-11	METAL CHIP 0 5% 1/16W	
R636	1-216-821-11	METAL CHIP 1K 5% 1/16W	

< VARIABLE RESISTOR >

RV101	1-238-086-11	RES, ADJ CERMET 470	
RV201	1-238-091-11	RES, ADJ CERMET 22K	
RV202	1-238-087-11	RES, ADJ CERMET 1K	

Ref. No.	Part No.	Description	Remark
RV203	1-238-088-11	RES, ADJ CERMET 2.2K	
RV204	1-238-087-11	RES, ADJ CERMET 1K	
RV205	1-238-091-11	RES, ADJ CERMET 22K	
RV206	1-238-088-11	RES, ADJ CERMET 2.2K	
RV207	1-238-089-11	RES, ADJ CERMET 4.7K	
RV210	1-238-088-11	RES, ADJ CERMET 2.2K	
RV211	1-238-092-11	RES, ADJ CERMET 47K	
RV301	1-238-086-11	RES, ADJ CERMET 470	
RV351	1-238-090-11	RES, ADJ CERMET 10K	
RV353	1-238-087-11	RES, ADJ CERMET 1K	
RV400	1-238-090-11	RES, ADJ CERMET 10K	
RV401	1-238-090-11	RES, ADJ CERMET 10K	

< SWITCH >

S201	1-572-275-11	SWITCH, SLIDE (IN/OUT)	(E, AUS)

< FLEXIBLE BOARD >

W702	1-633-976-11	FP-251 FLEXIBLE BOARD	

< CRYSTAL >

X301	1-577-117-21	OSCILLATOR, CRYSTAL (4.433619MHz)	

****

SECTION 3
ADJUSTMENT

3-1. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

Connect the audio system measuring instrument as shown in the following figure as well as the video system measuring instrument, and perform the adjustment at the 「Video」 position of the power switch.

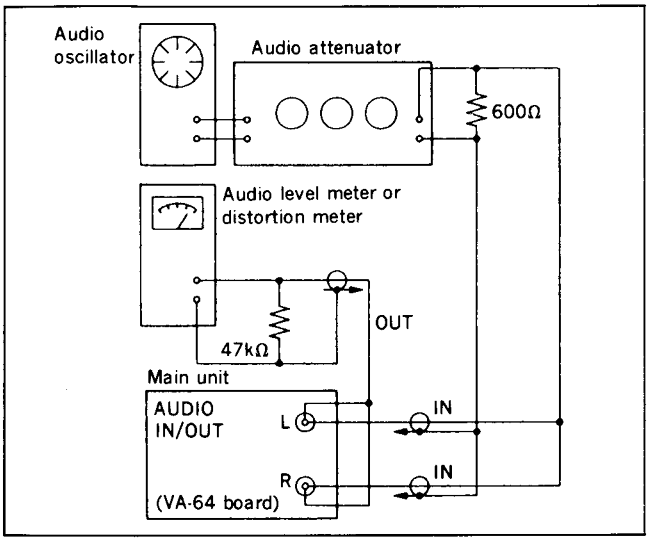


Fig. 3-1.

[Adjustment Spequence]

1) AFM Carrier Frequency Check
2) IR Adjustment
3) Deviation Adjustment
4) Playback Level Check
5) Overall Output Level Check
6) Overall Frequency Characteristics Check
7) Overall Distortion Check
8) Overall Noise Level Check

3-1-1. AFM Carrier Frequency Check (VA-46P Board)

Mode	Recording
Signal	No-signal
Measurement point	IC400 pin ⑧
Measuring instrument	Frequency counter
Specified value	1.50±0.02MHz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Checking Method]

1) Turn off the output of the audio oscillator.
2) Check that the AFM carrier frequency in 1.50±0.01MHz.

3-1-2. IR Adjustment (VA-46P Board)

Mode	Self-recording and playback
Signal	Record no signal by inserting shorting plugs into andio input jacks. Playback the recorded section.
Measurement point	IC400 pin ㊹ — IC400 pin ⑥
Measuring instrument	Digital voltmeter
Adjustment element	RV400
Specified value	Less than ±10mV

[Adjustment Method]

1) Adjust alternately the RV400 to be below ±10mV.

3-1-3. Deviation Adjustment (VA-46P Board)

Mode	Playback
Signal	Alignment tape for AFM stereo checking operation (WR5-9CS). Monoscope portion.
Measurement point	IC400 pin ㉔
Measuring instrument	Level meter
Adjustment element	RV401
Specified value	−15.0±0.2dBs

[Adjustment Method]

1) Adjust alternately the RV401 to be −15.0±0.2dBs.

3-1-4. Playback Level Check

Mode	Playback
Signal	Alignment tape : Operation checking (WR5-5CSP)
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Confirm that the audio output level is −7.5±2dBs.

3-1-5. Overall Output Level Check

Mode	Self-recoading and playback
Signal	400Hz, —7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	—7.5±3dBs

[Checking Method]

1) Recoad the signal.
2) Playback the recoding section.
3) Make sure that the audio output level is −7.5±3dBs.

3-1-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, −17.5dBs Ⓑ 30Hz, −17.5dBs Ⓒ 10Hz, −17.5dBs
Measurement point	Audio output termial
Measuring instrument	Audio level meter
Specified value	With the 400Hz playback output level as 0dB, the playback output level of 30Hz and 10kHz is 0±3dB

[Checking Method]

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback output level as 0dB, confirm that the playback output level of 30Hz and 10kHz is 0±3dB.

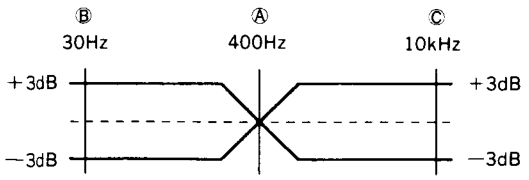


Fig. 3-2.

3-1-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Distorsion meter
Specified value	Less than 0.8%[*1]

[Checking Method]

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.8%.[*1]

[*1] Value when 200Hz to 3kHz BPF is used.

3-1-8. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (Shorting plug is inserted into audio input jack)
Measurement point	Audio input terminal
Measuring instrument	Audio level meter
Specified value	Less than −61.5dBs[*2]

[Checking Method]

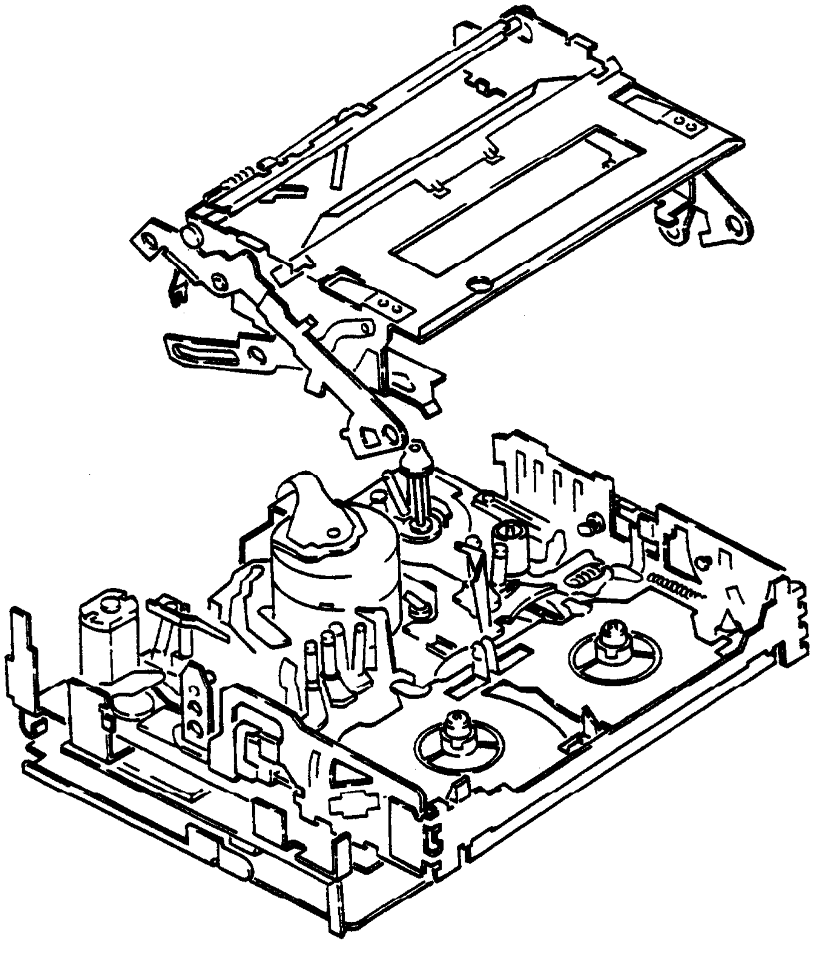
1) Record the signal
2) Playback the recorded section
3) Make sure that the noise level is less than −61.5dBs.[*2]

[*2] Value when IHF-A hearing correction filter is used.

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ●, and then, the LS support ●.
3) Remove the four screws ●, and then, the LS frame assy ●.
4) Remove the three lock washers ●, and then, the washer ●, bar, joint ●, T protector assy ●, and TP arm assy ● in that order.
5) Remove the two screws●, and then, the two arm shafts A●.
6) Remove the shaft through the long hole●. With the cassette compartment holder assembly●rotated in a direction of the arrowⒶ, remove the long holes●and●from the shaft in that order, and then, remove the cassette compartment holder assembly●.
7) Slide the BS holder●in a direction of the arrow Ⓑ as shown in Fig. A and remove it in a direction of the arrowⒸ.

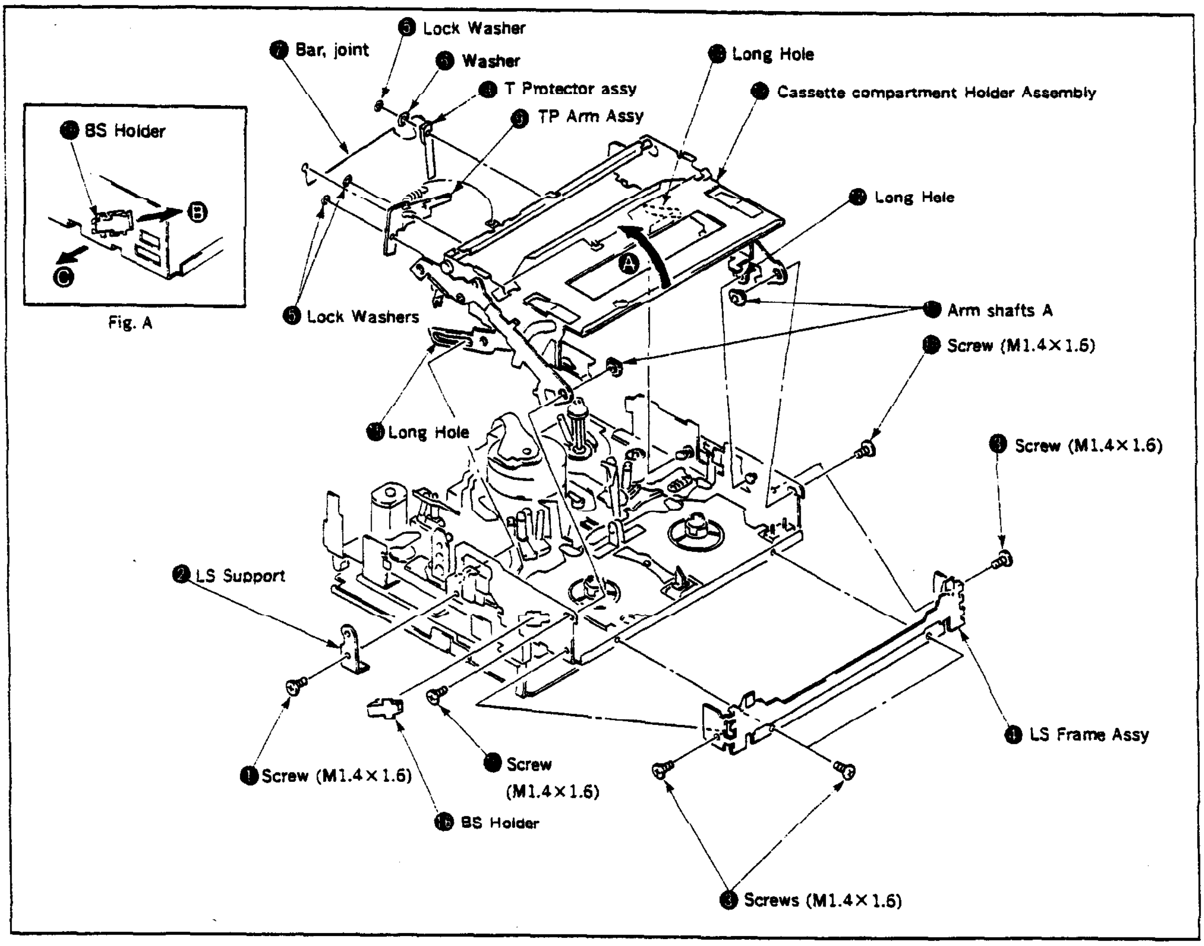
Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ●.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder●in the reverse order of its removal.
Note : Refer to Fig. A.
3) Mount the shafts in the order of the long holes ●, ●and● of the cassette compartment holder assembly●, respectively.

Note : When this is done. rotate the cassette compartment holder assembly●in a direction of the arrow Ⓐ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A●with the long holes of the LS chassis, fit them in firmly and fix with the two screws●.
5) Mount the TP arm assy ●, T protector assy ● and bar, joint ●, respectively. Then, mount the washer ● and three lock washers ●.
6) Mount the LS frame assy ● to the chassis and fix with the four screws ●.
7) Mount the LS support ● to the chassis and fix with the screw ●.



● BS Holder
Ⓑ
Ⓒ
Fig. A
● Lock Washer
● Bar, joint
● Washer
● T Protector assy
● TP Arm Assy
● Long Hole
● Cassette compartment Holder Assembly
● Long Hole
Ⓐ
● Lock Washers
● Arm shafts A
● Screw (M1.4×1.6)
● Long Hole
● Screw (M1.4×1.6)
● LS Support
● LS Frame Assy
● Screw (M1.4×1.6)
● Screw (M1.4×1.6)
● BS Holder
● Screws (M1.4×1.6)

Fig. 1

1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

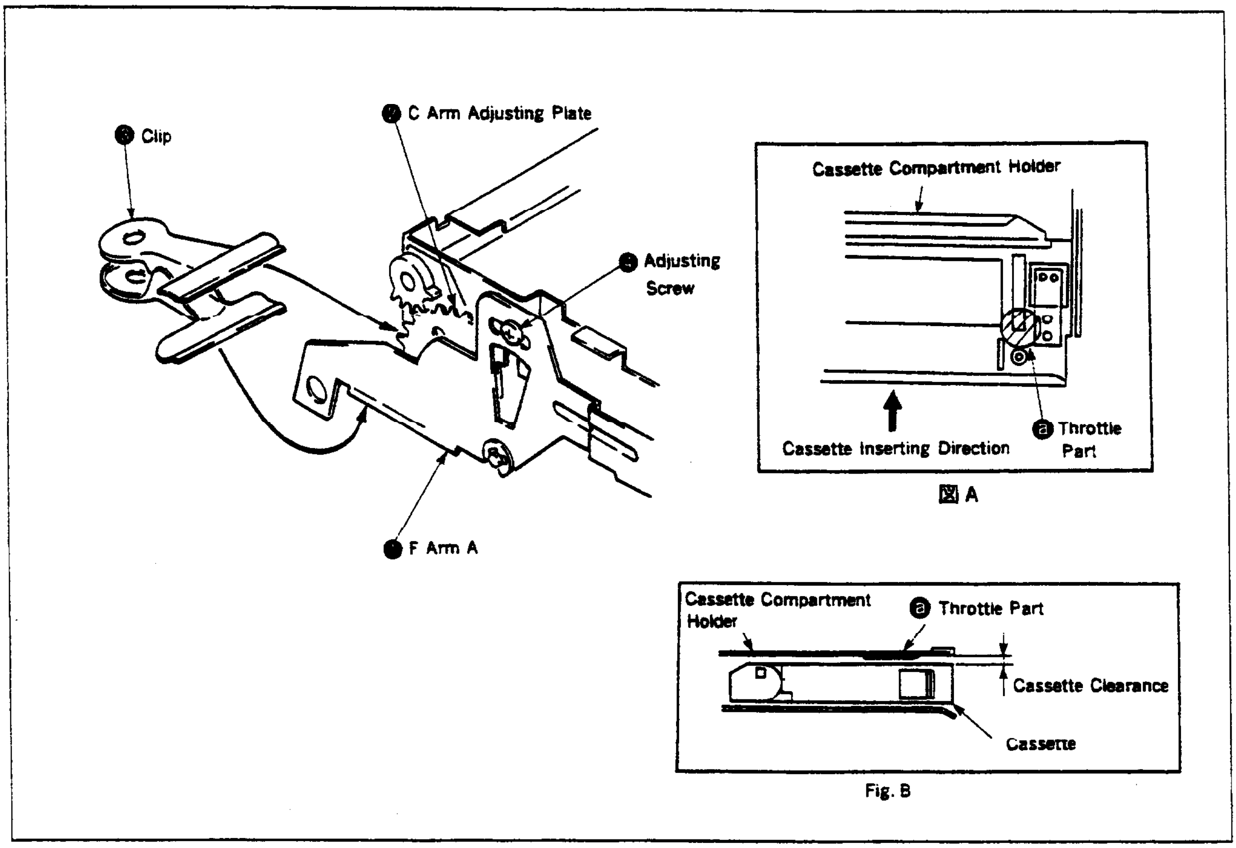
1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle partⓐ.

2) Pressing the partⓐ, nip the F arm A ● and the first tooth of the C arm adjusting plate ● with the clip ●, and tighten the adjusting screw ● at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ● after making sure of the following clearances between the throttle partⓐ of the cassette compartment holder and the cassette as shown in Fig. B.

- For 15mm-thick dummy cassette : 0.5 – 0.9
- For 15.2mm-thick dummy cassette : 0.3 – 0.7


● Clip
● C Arm Adjusting Plate
● Adjusting Screw
● F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ● on the LED assembly ●.
3) Press the pin of the push switch ● (ON state) and fix it with adhesive tape ● in that state.
4) Press the locking plate release arm ● in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ● and ● for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ● and ●.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

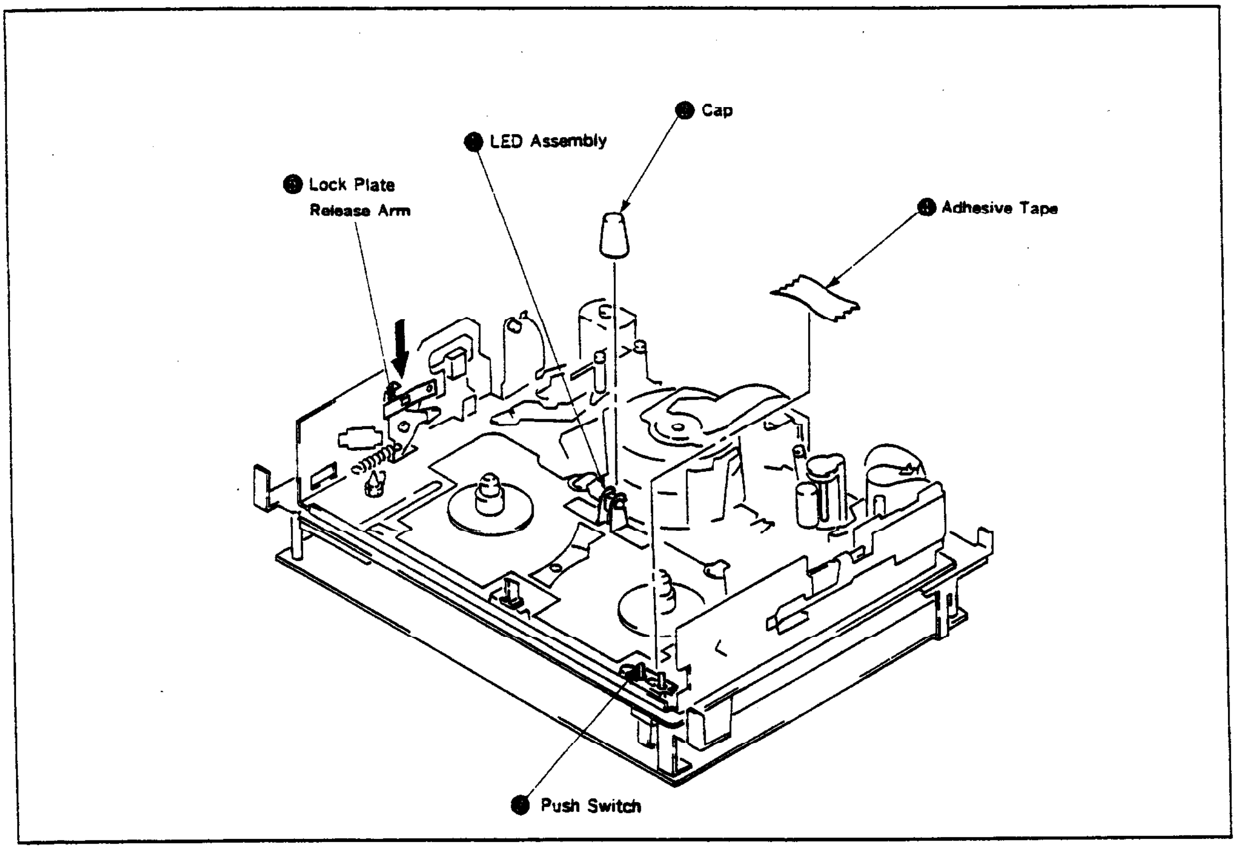


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

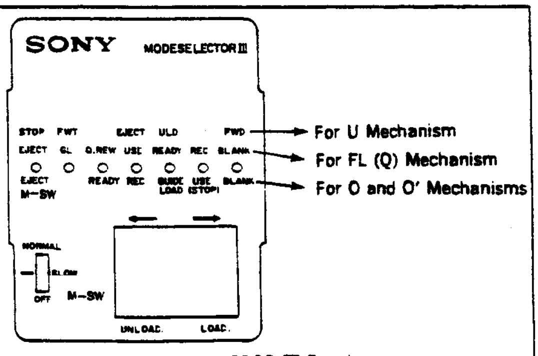
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ❶.
2) Remove the screw ❷, and then, the LB-12 board ❸.
3) Remove the FP-114 flexible connector ❹ and loading motor connector ❺, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD.
LOAD.
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

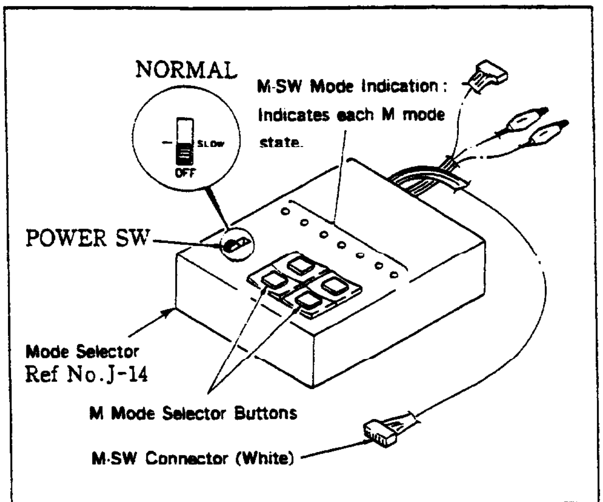

NORMAL
M-SW Mode Indication : Indicates each M mode state.
SLOW
OFF
POWER SW
Mode Selector
Ref No.J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

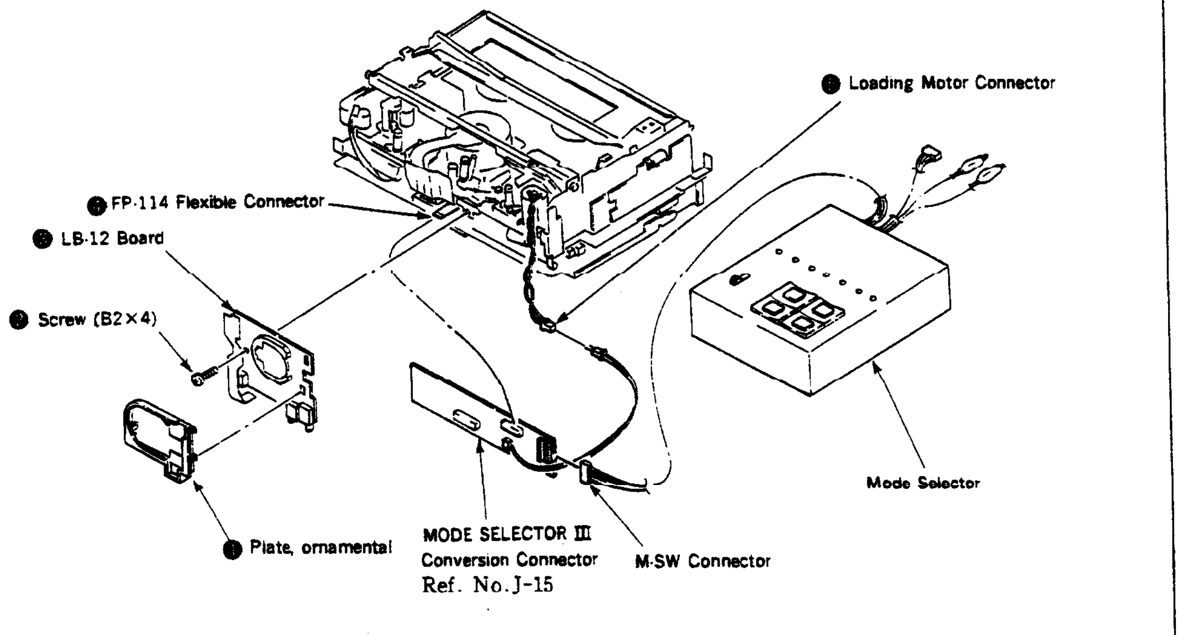
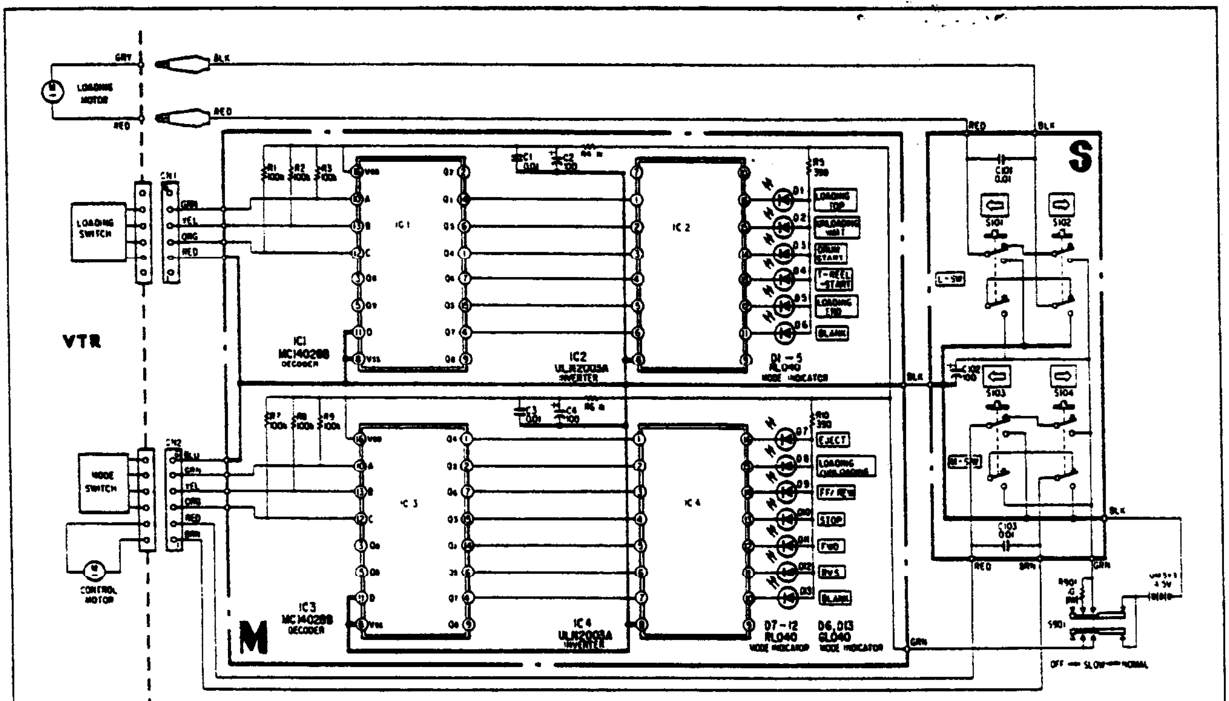

❺ Loading Motor Connector
❹ FP-114 Flexible Connector
❸ LB-12 Board
❷ Screw (B2×4)
❶ Plate, ornamental
MODE SELECTOR III
Conversion Connector
Ref. No.J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


LOADING MOTOR
GRY
BLK
RED
LOADING SWITCH
CN1
GRN
YEL
ORG
RED
VTR
MODE SWITCH
CN2
BLU
CONTROL MOTOR
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
D1 – 5
RL040
MODE INDICATOR
D7 – 12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
EJECT
LOADING UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
S
M
L-SW
M-SW
S101
S102
S103
S104
C101 0.01
C102 100
C103 0.01
R901
S901
OFF → SLOW → NORMAL

M-SW
IC 3

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW
IC 1

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description			
		CAPACITOR			
C1	1-108-579-00	MILER	0.01μF	50V	
C2	1-123-333-00	ELECT	100μF	24V	
C3	1-108-579-00	MILER	0.01μF	50V	
C4	1-123-333-00	ELECT	100μF	24V	
C101	1-108-579-00	MILER	0.01μF	50V	
C102	1-123-333-00	ELECT	100μF	24V	
C103	1-108-579-00	MILER	0.01μF	50V	
		DIODE			
D1	8-719-812-31	DIODE TLR123			
D2	8-719-812-31	DIODE TLR123			
D3	8-719-812-31	DIODE TLR123			
D4	8-719-812-31	DIODE TLR123			
D5	8-719-812-31	DIODE TLR123			
D6	8-719-812-33	DIODE TLG123A			
D7	8-719-812-31	DIODE TLR123			
D8	8-719-812-31	DIODE TLR123			
D9	8-719-812-31	DIODE TLR123			
D10	8-719-812-31	DIODE TLR123			
D11	8-719-812-31	DIODE TLR123			
D12	8-719-812-31	DIODE TLR123			
D13	8-719-812-33	DIODE TLG123A			
		IC			
IC1	8-752-240-28	IC TC4028BP			
IC2	8-752-120-03	IC μPA2003C			
IC3	8-759-240-28	IC TC4028BP			
IC4	8-759-120-03	IC μPA2003C			
		RESISTOR			
R1	1-247-179-00	CARBON	100K	1/4W	
R2	1-247-179-00	CARBON	100K	1/4W	
R3	1-247-179-00	CARBON	100K	1/4W	
R4	1-247-131-00	CARBON	1K	1/4W	
R5	1-247-121-00	CARBON	390	1/4W	
R6	1-247-131-00	CARBON	1K	1/4W	
R7	1-247-179-00	CARBON	100K	1/4W	
R8	1-247-179-00	CARBON	100K	1/4W	
R9	1-247-179-00	CARBON	100K	1/4W	
R10	1-247-121-00	CARBON	390	1/4W	
R901	1-214-594-00	METAL	10	1W	

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

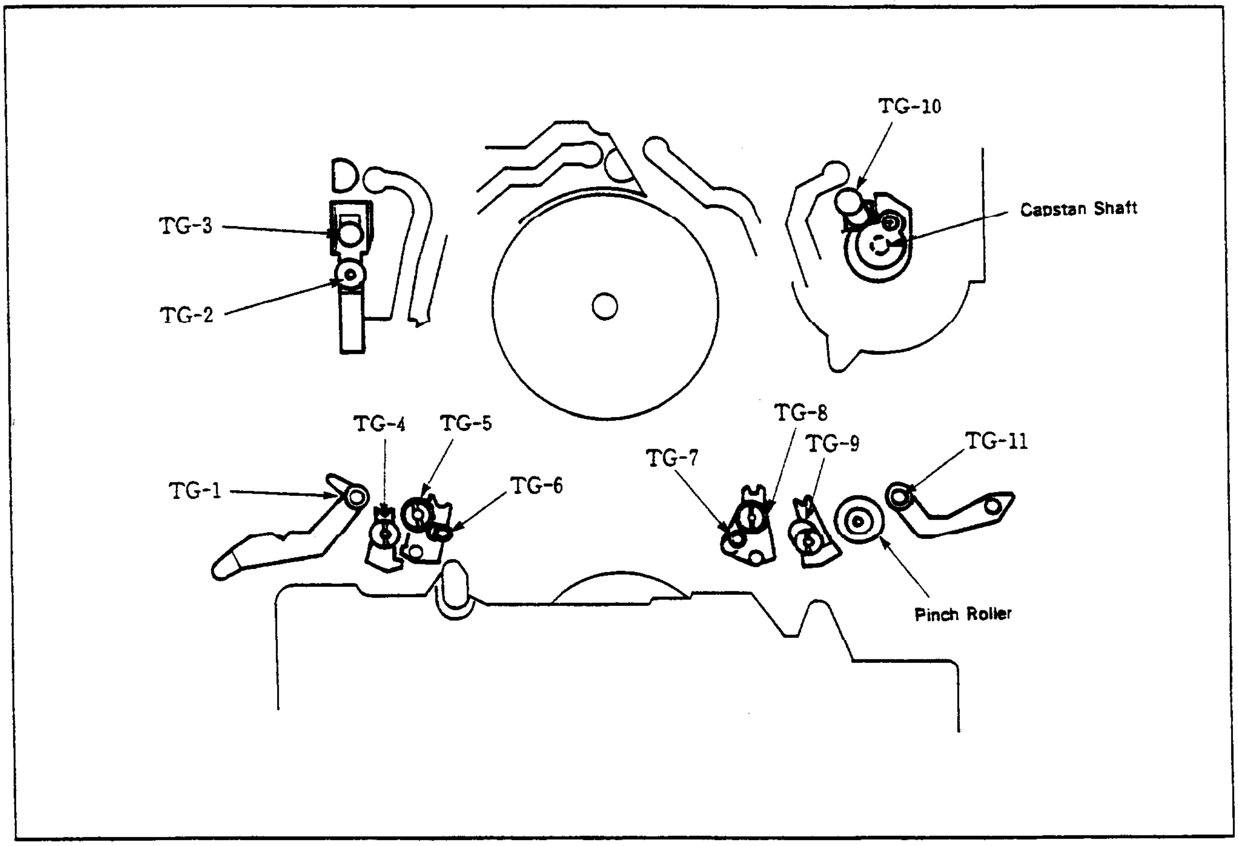


Fig. 7

2-3 PERIODIC CHECK ITEMS

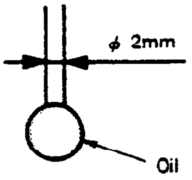
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-212-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

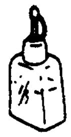


2-4 Service jigs list

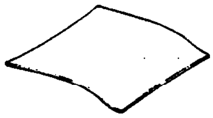
Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector III panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector III conversion connector	J-6082-021-A		

Other equipment
- Oscilloscope
- Analog tester (20kΩ)

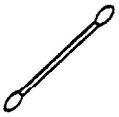
J-1



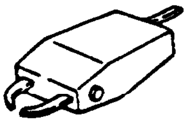
J-2



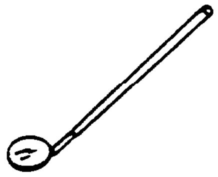
J-3



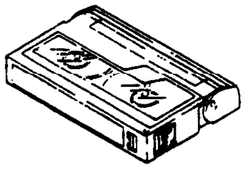
J-4



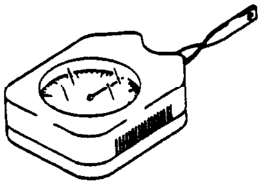
J-5



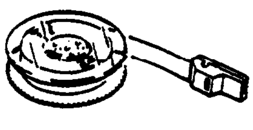
J-6



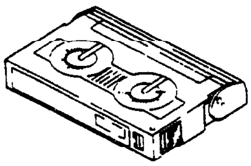
J-7



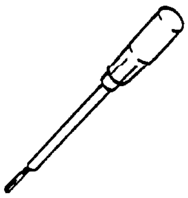
J-8



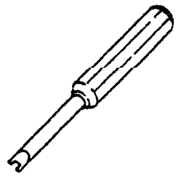
J-9



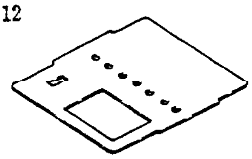
J-10



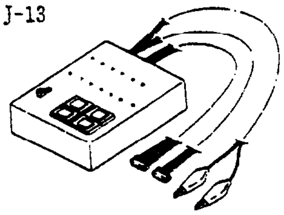
J-11



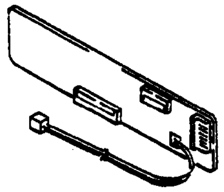
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A, rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrow Ⓑ.
4) Remove the three screws ❶, ❷ and ❸.
5) Lifting the LED base ❹, remove it by pushing it in a direction of the arrow Ⓒ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ❺ of the LED base ❹ in the notch ❼ of the LS chassis without catching the LED in between. Next, fit to the dowels ❻ at 2 places.
3) Mount and tighten the screws ❸, ❷ and ❶ in that order.
4) As shown in Fig. B, set the LED in a direction of the arrow Ⓐ and rotate it in a direction of the arrow Ⓑ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ❽ of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

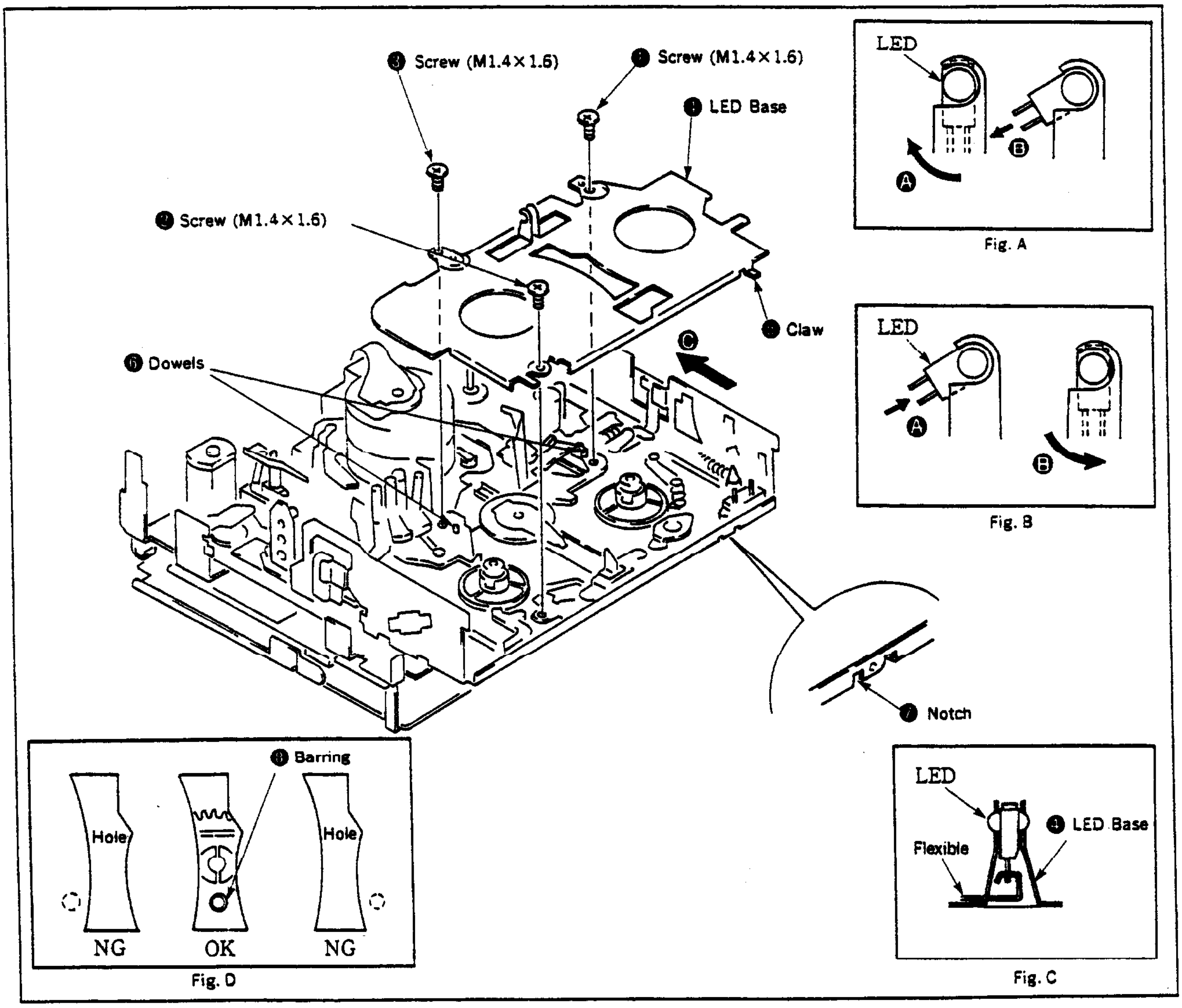

❸ Screw (M1.4×1.6)
❶ Screw (M1.4×1.6)
❹ LED Base
❷ Screw (M1.4×1.6)
❺ Claw
❻ Dowels
Ⓒ
❼ Notch
LED
Ⓐ
Ⓑ
Fig. A
LED
Ⓐ
Ⓑ
Fig. B
LED
❹ LED Base
Flexible
Fig. C
❽ Barring
Hole
Hole
NG
OK
NG
Fig. D

Fig. 8

3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

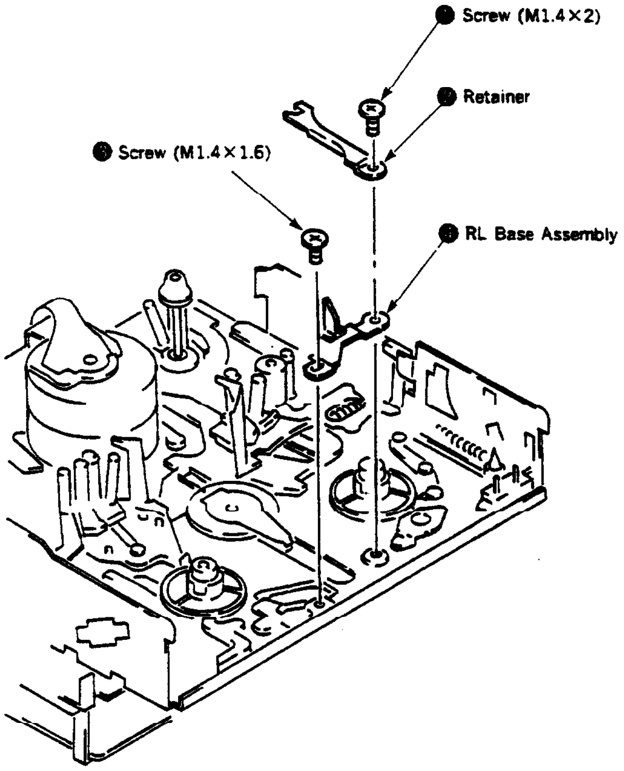
1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, retainer ●.
5) Remove the screw ●, and then, RL base assembly ●.

2. Mounting

1) Select the USE mode.
2) With the screw ●, mount the RL base assembly ● to the LS chassis.
3) With the screw ● fix the retainer ● to the RL base assembly ●.

   When this is done, align the bump part ⁎ of the retainer ● with the bump part ⁎ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.


● Screw (M1.4×2)
● Retainer
● Screw (M1.4×1.6)
● RL Base Assembly

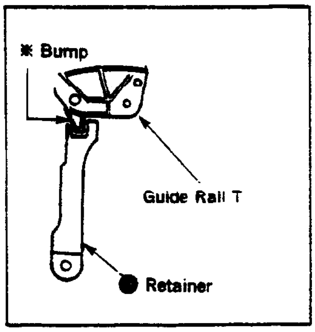

⁎ Bump
Guide Rail T
● Retainer

Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ● in the USE mode, remove the string out of the groove of the table assy, reel, supply ●. When this is done, be careful not to bend the tension regulator string ● and the S soft arm ● must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ●.

Note : Dismount and remount the table assy, reel, supply ●, holding the reel claw ✻.

2. Mounting

1) Select the USE mode.
2) As shown in Fig. B, move the S soft arm ● in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ●, mount the table assy, reel, supply ● to the shaft ●.
4) Put the tension regulator string ● in the groove of the table assy, reel, supply ● and fit it properly by turning the table assy, reel, supply ●.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ● with naked hand. Also, be careful of adhesion of grease, etc.

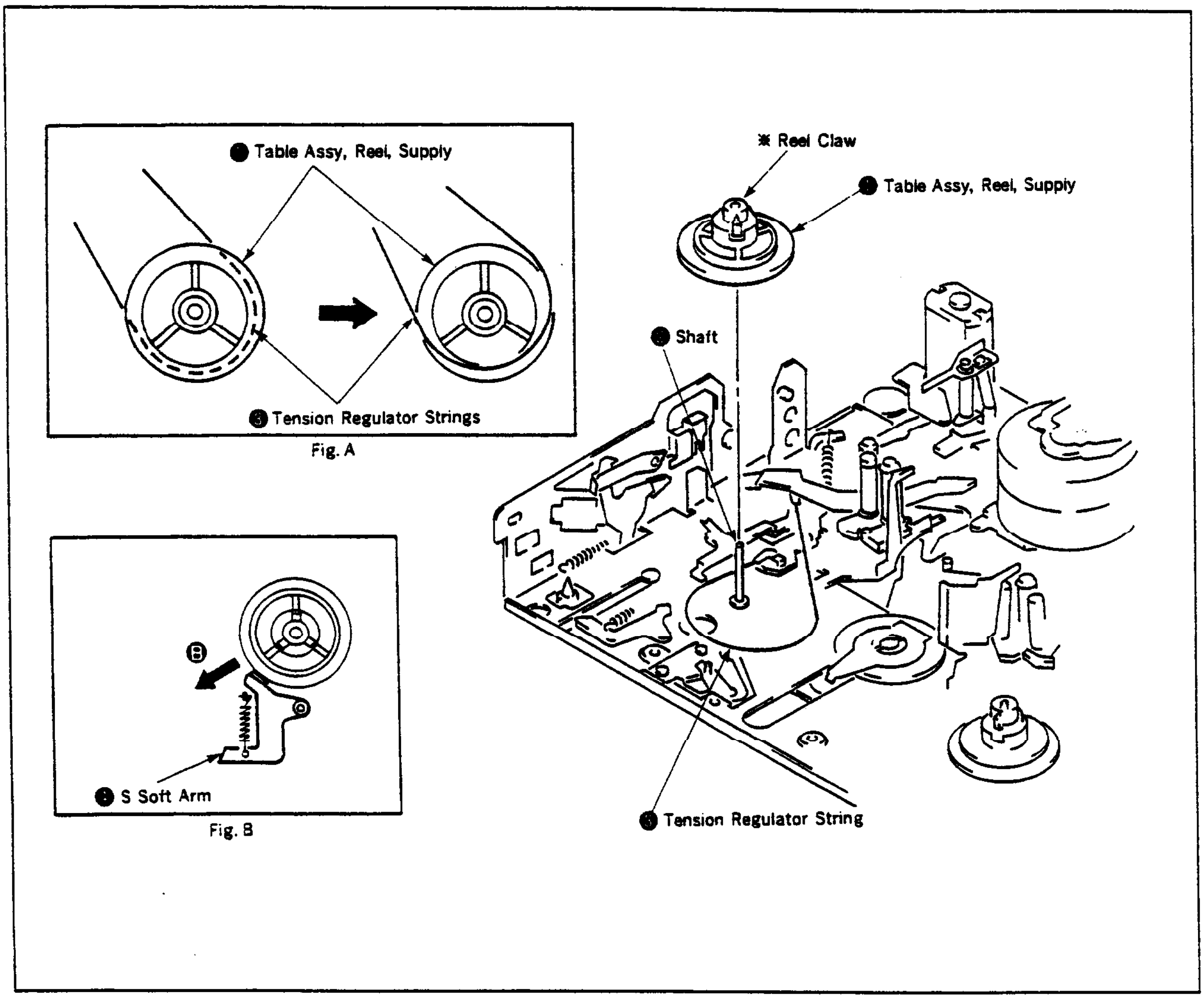

● Table Assy, Reel, Supply
● Tension Regulator Strings
Ⓑ
● S Soft Arm
✻ Reel Claw
● Table Assy, Reel, Supply
● Shaft
● Tension Regulator String

Fig. A

Fig. B

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ● in a direction of the arrowⒶ.
6) With the claw (T ratchet head) of the T ratchet ● moved in a direction of the arrowⒷ, remove the Table assy, reel, take-up ●.

Note : Dismount and remount the Table assy, reel, take-up ●, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ● moved in an arrow direction, mount the Table assy, reel, take-up ● to the shaft ●.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

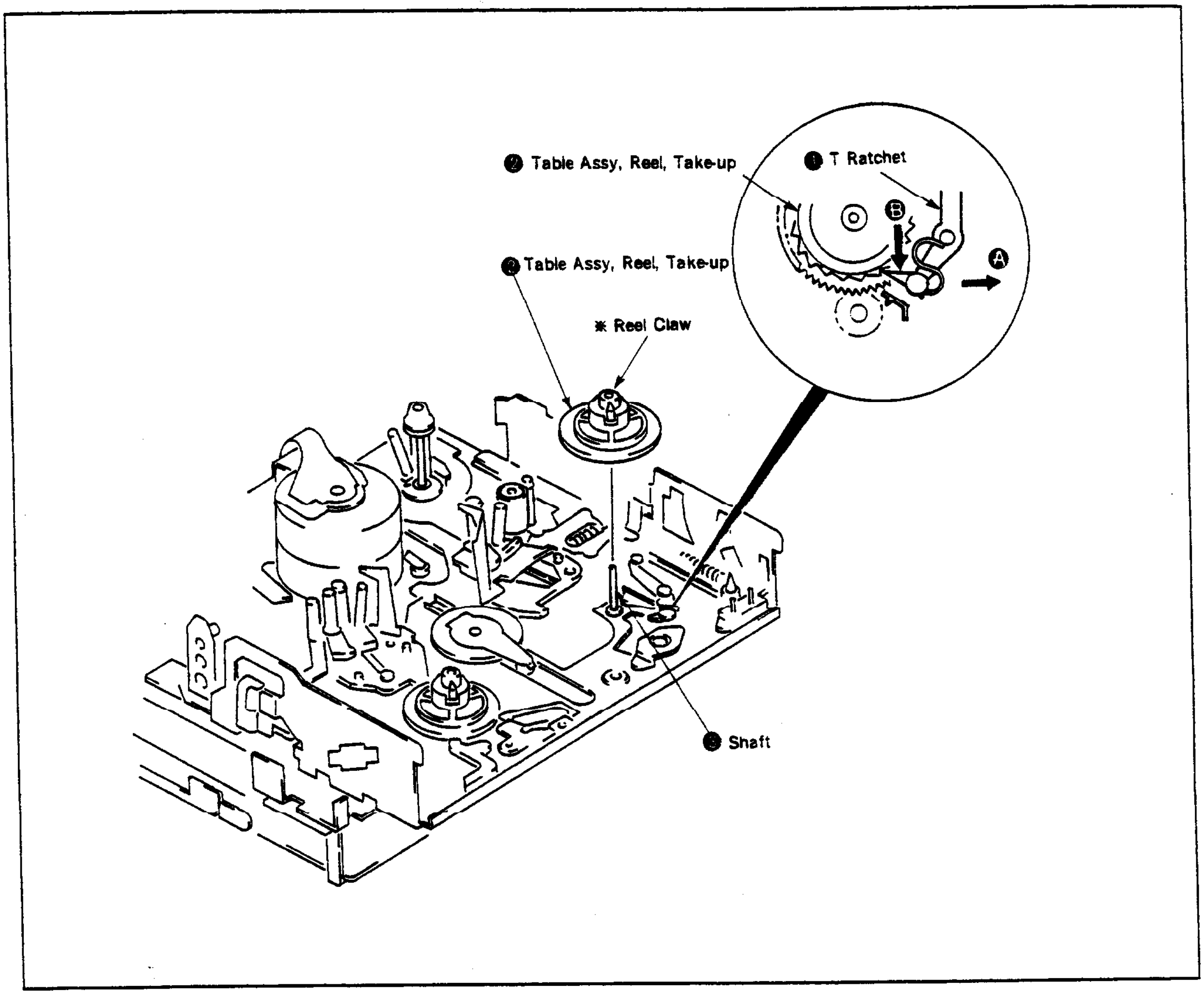


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, oneway clutch assembly ●.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ● to the LS chassis and fix with the screw ●.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

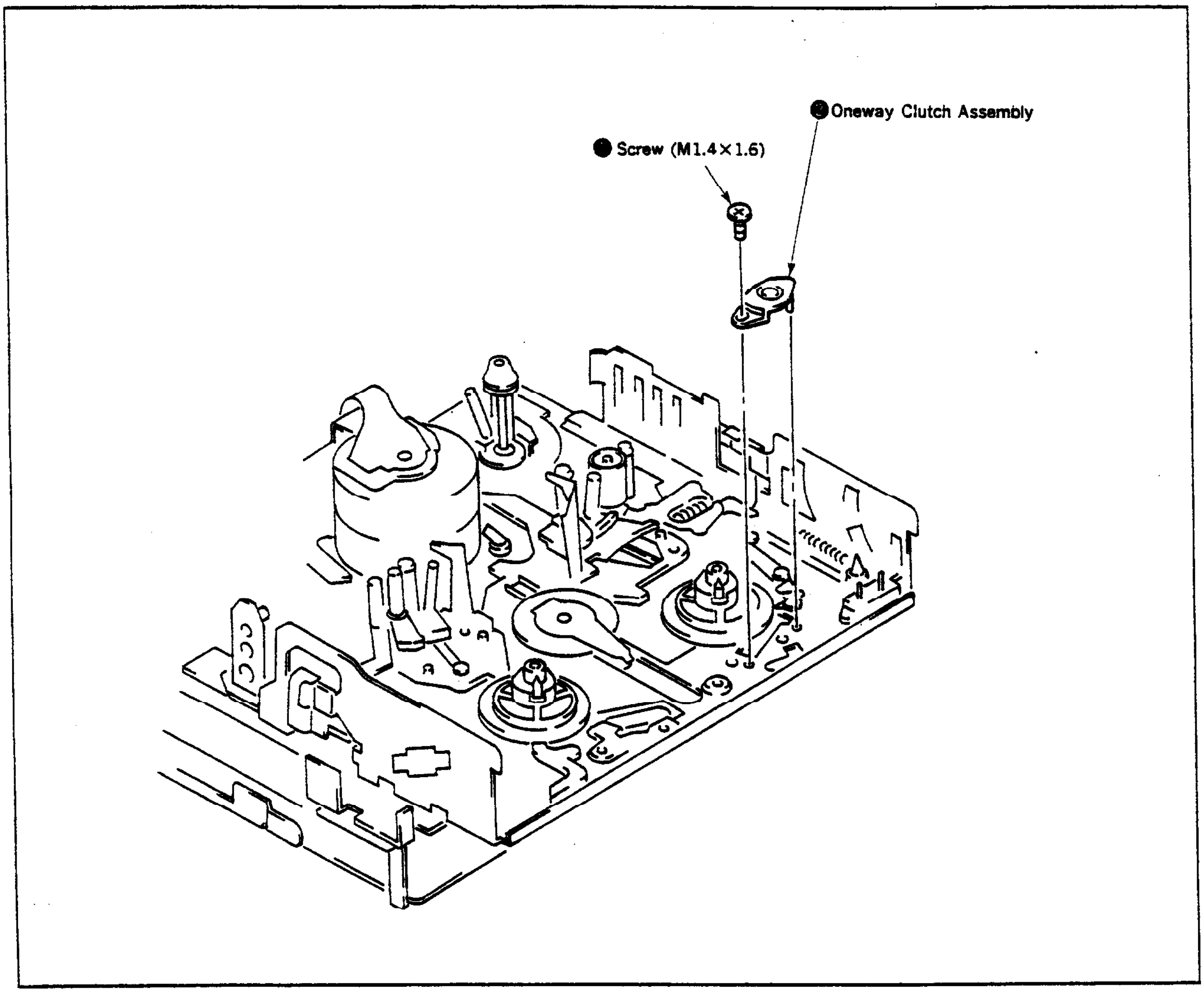


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ●, and then, the spring, tension ●.
5) Remove the S soft arm assembly ● by rotating it in an arrow direction (until the hook ● comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowindicated part of the shaft ●.
3) Mount the S soft arm assembly ● to the shaft ●, rotating it in as arrow direction. (Be careful not to bend the hook ●.)
4) Hook the spring, tension 2 onto the claw and fix it with lock washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

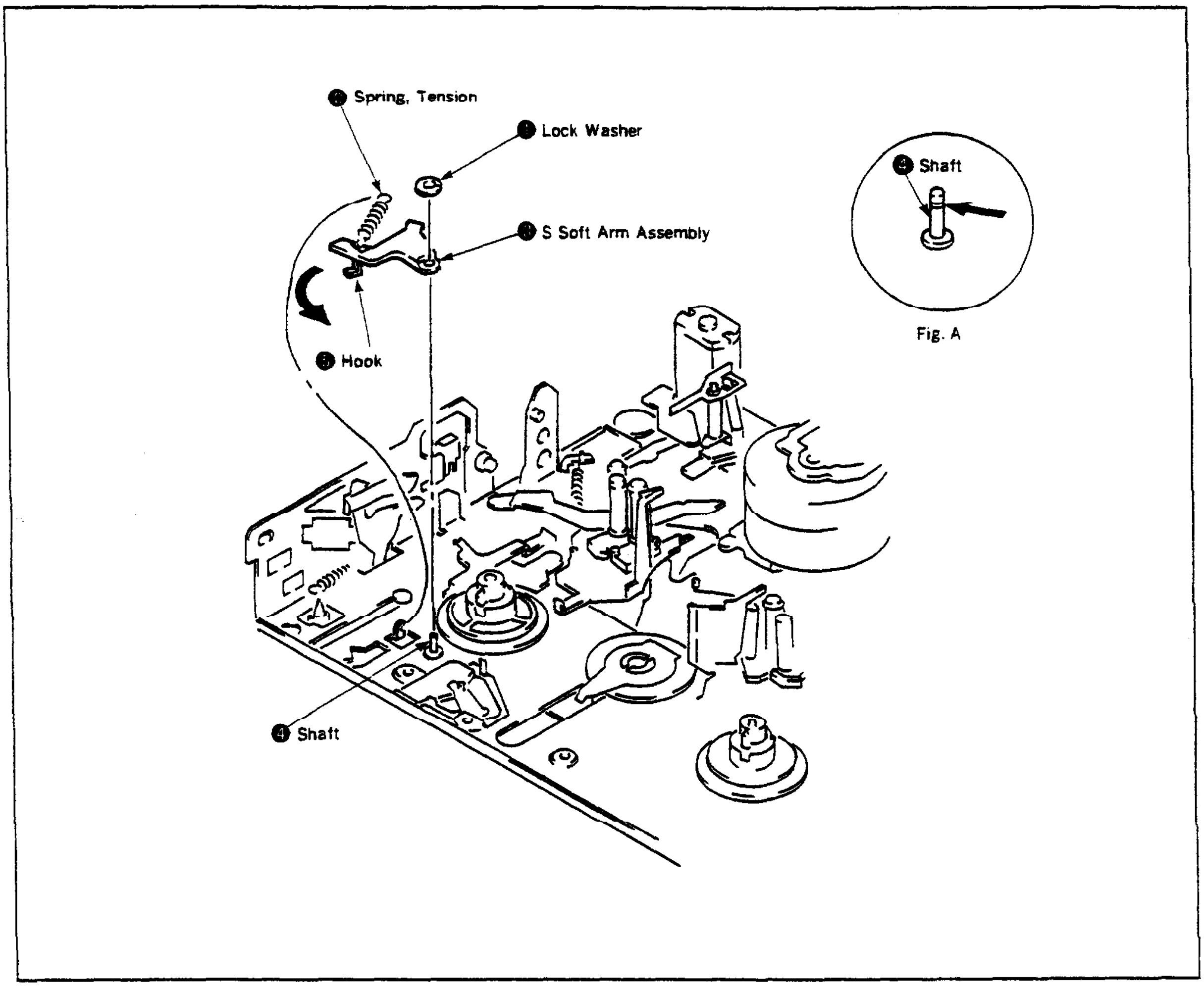


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ❶, and then, arm assy gear ❷.
6) Select the Q, REW mode.
7) Remove the flexible rotary shaft ❸, and then, the flexible connector ❹.
8) Remove the E retaining ring ❺ and three screws ❻.
9) Remove the LS chassis assembly ❼ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ❼.
2) Unload in the RDY mode. Start docking in the Q, REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ❼, it is necessary to place the following parts at specified positions.
3) Put the pin ●of the pinch arm assembly ●into the left side of the pinch press arm assembly●. (Fig.19)
4) Move the TG-1 arm assembly●in a direction of the arrow Ⓐ to put the pin ●into the concave of the arm assembly ●. (Fig. 17)
5) put the pin●of the S ratchet●into the right side the of the arm assembly●. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ● With the arm arc portion of the guide arm T assembly● (Fig. 15) to push the LS chassis assembly ❼ in a direction of the arrowⒺ, and at the same time, engage the claws of the guide rail base 1●, guide rail base 2●and guide rail base3●with those of the guide rail S● and guide rail T●. (Fig. 16)

Then, align the shafts ❾ of the mechanical chassis With the four long joints of the LS chassis assembly ❼, and put the LS pin●of the LS arm assembly●in the groove of the LS cam plate●. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ❺ and three screws ❻.
7) Mount the flexible rotary shaft ❸ and flexible connector ❹.
8) Select the USE mode.
9) Mount the arm assy gear ❷ and fix with the lock washer ❶.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

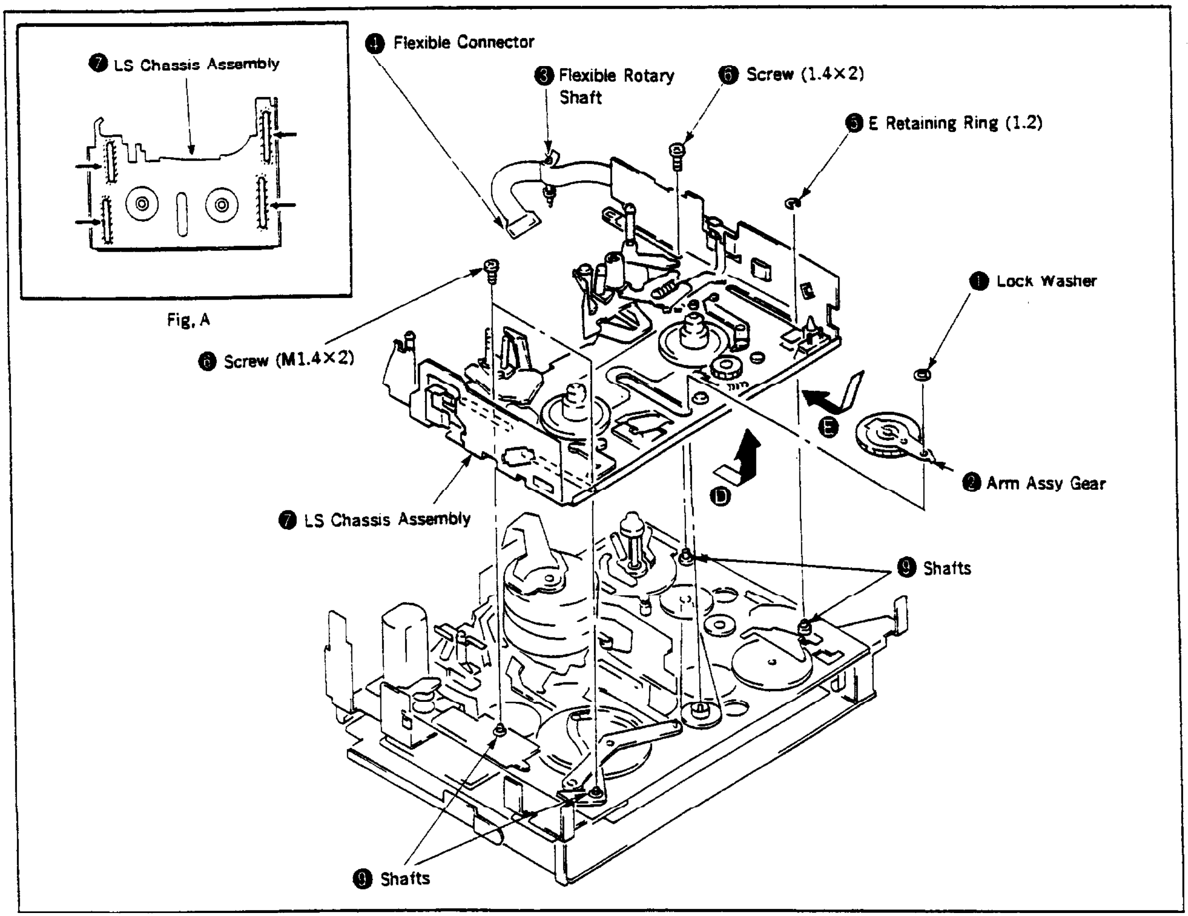


Fig. 14

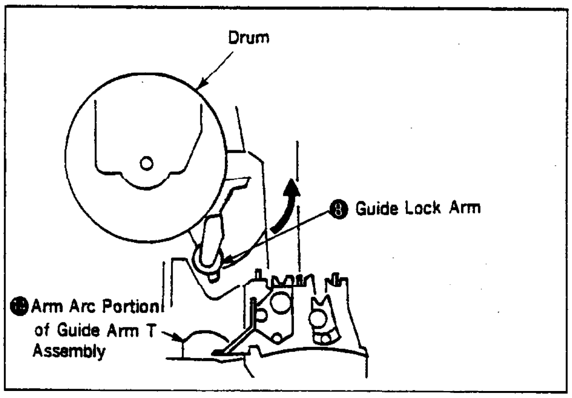

Drum
Guide Lock Arm
Arm Arc Portion of Guide Arm T Assembly

Fig. 15

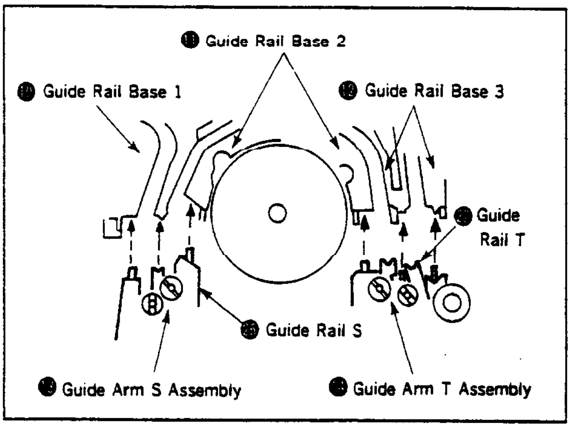

Guide Rail Base 2
Guide Rail Base 1
Guide Rail Base 3
Guide Rail T
Guide Rail S
Guide Arm S Assembly
Guide Arm T Assembly

Fig. 16

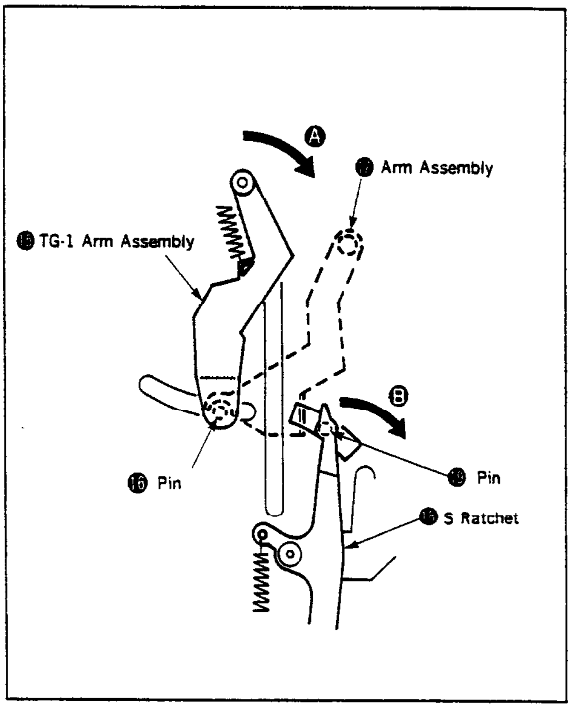

A
Arm Assembly
TG-1 Arm Assembly
B
Pin
Pin
S Ratchet

Fig. 17

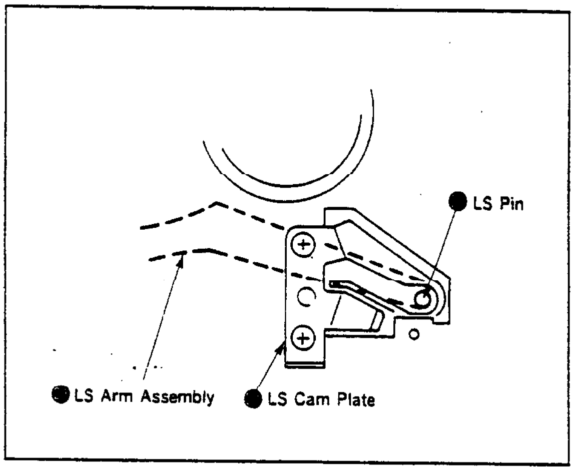

LS Pin
LS Arm Assembly
LS Cam Plate

Fig. 18

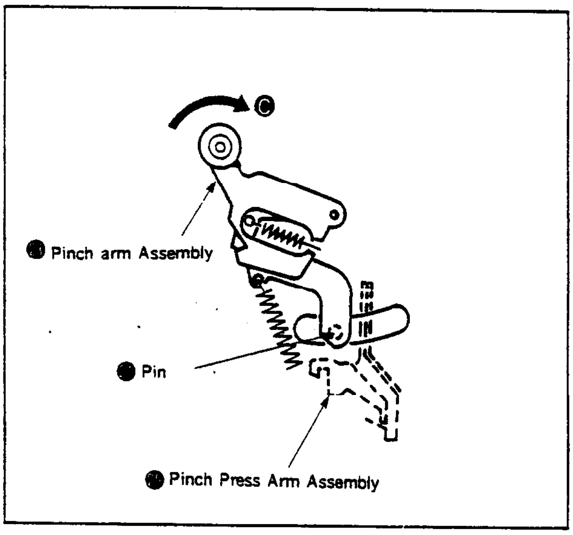

C
Pinch arm Assembly
Pin
Pinch Press Arm Assembly

Fig. 19

-8 PINCH ARM ASSEMBLY (Fig. 20)

. Removal

) Referring to 1-1, remove the cassette compartment holder assembly.

) Referring to 3-7, remove the LS chassis assembly.

) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.

) Remove the spring, tension ❸, and then, pinch arm assembly ❹.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❺ over one third of a drip up to half a drip.

2) put the rotation center of the pinch arm assembly in the boss ❺ hole, and the pin ❻ in the long hole.

3) Hook the spring, tension ❸ onto the upper groove of the pinch return spring shaft ❼.

4) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.

5) Referring to 3-7, mount the LS chassis assembly.

6) Referring to 1-1, mount the cassette compartment holder assembly.

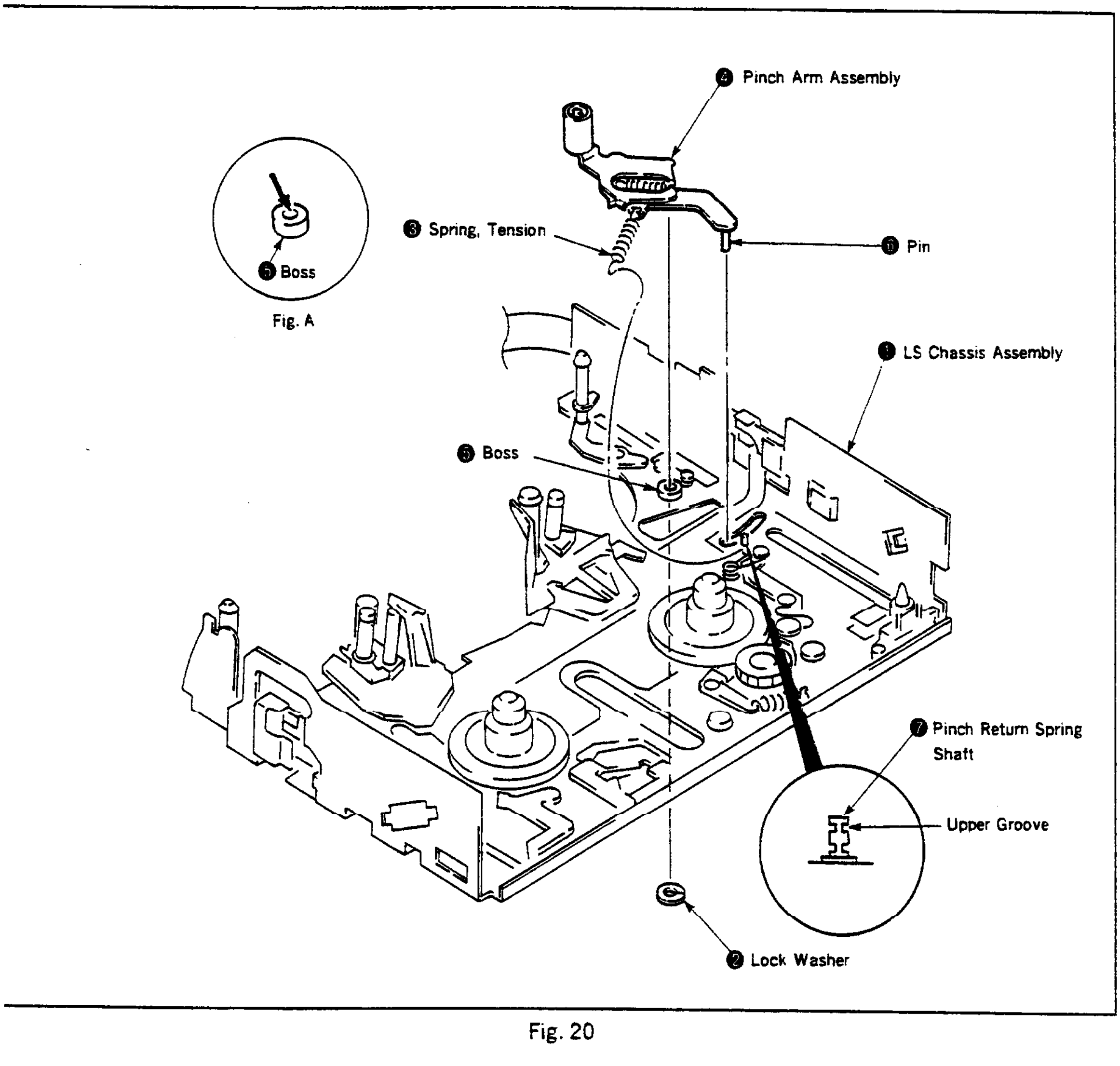

❹ Pinch Arm Assembly
❸ Spring, Tension
❻ Pin
❺ Boss
Fig. A
❶ LS Chassis Assembly
❺ Boss
❼ Pinch Return Spring Shaft
Upper Groove
❷ Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

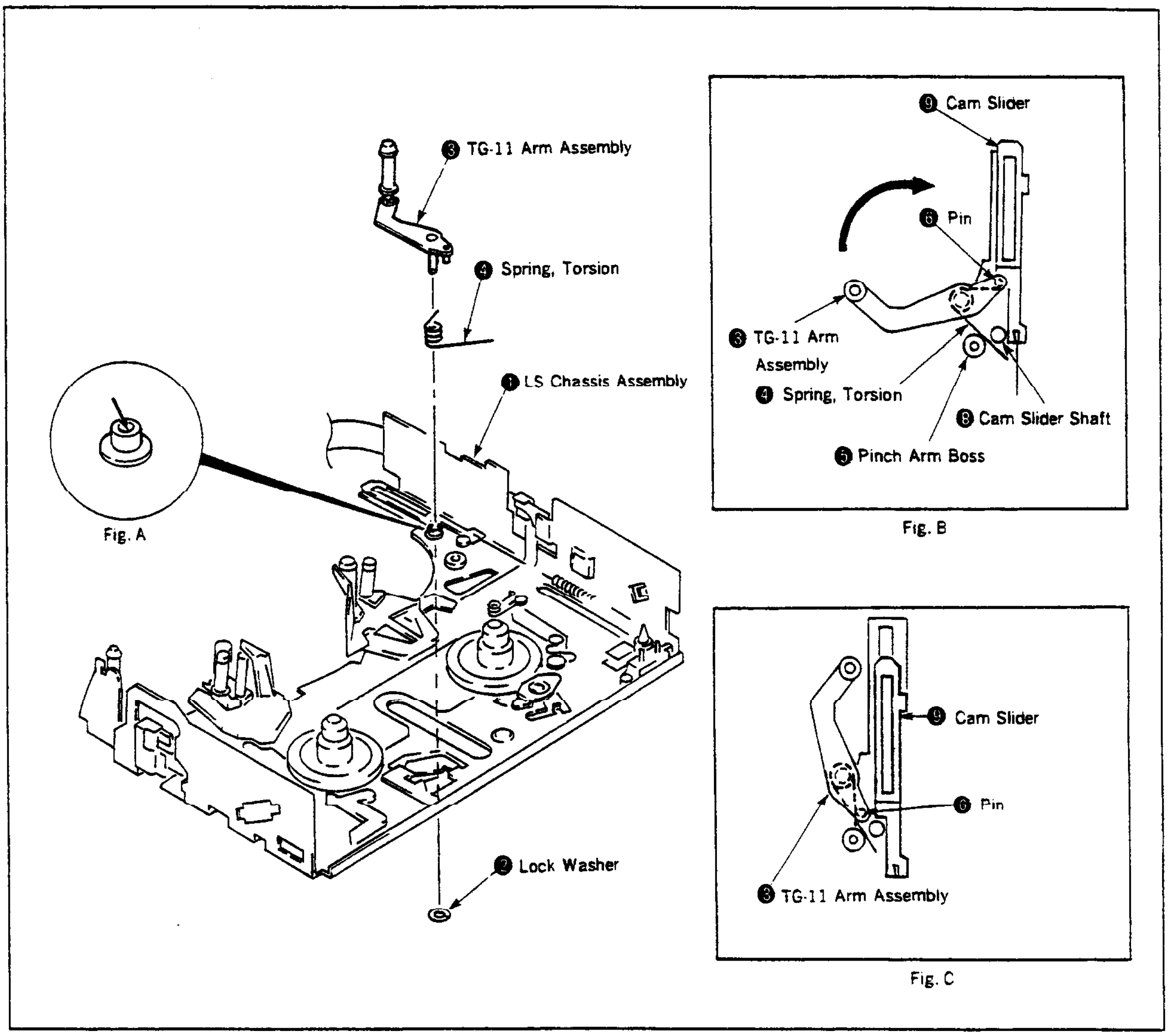

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer
Fig. A
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss
Fig. B
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28, adjust a FWD back tension.

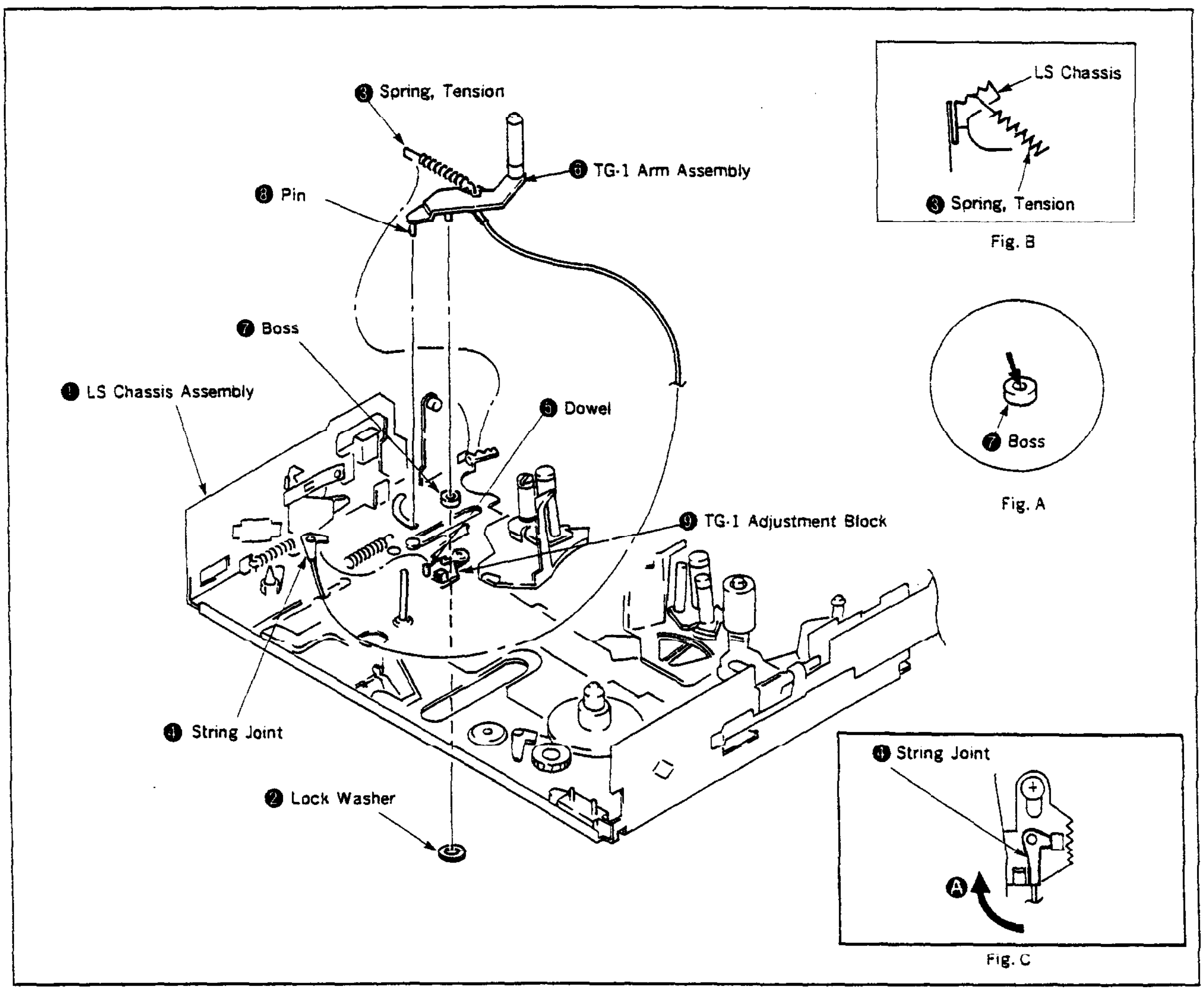

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
Fig. B
❼ Boss
Fig. A
❹ String Joint
Ⓐ
Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ✱.

Note : The joint holder ❷, which was removed once, must not be used again.

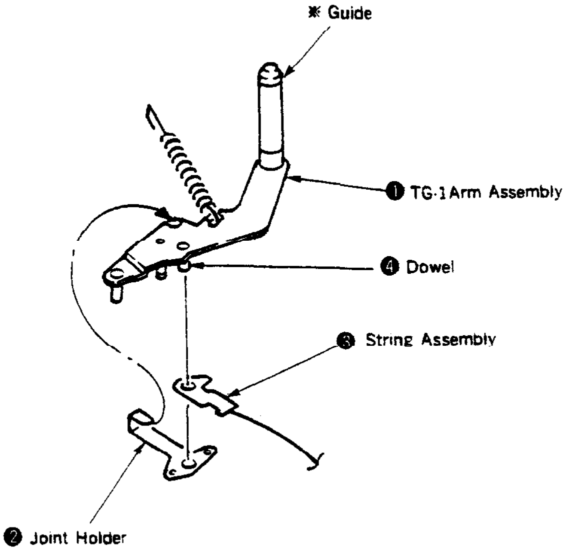

✱ Guide
❶ TG-1 Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove *the LS chassis assembly.*
3) Rotate the guide arm T assembly ① and guide arm S assembly in arrow directions respectively, align their shafts ③ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ✱. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the *arrows respectively.*
2) Fit the TG-7 base assembly ⑤ and TG-9 base assembly ⑥ in the grooves of the guide rail T ④. (Fig. 25)
3) Put the shaft ③ flange in the long groove of the guide rail S ⑧, and fit the TG-4 base assembly ⑨ and TG-6 base assembly ⑩ into the right and left grooves of the guide rail S ⑧ respectively.

   When this is done, see to it that the flat spring of the TG-6 base assembly⑩ is located below the guide rail S ⑧ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

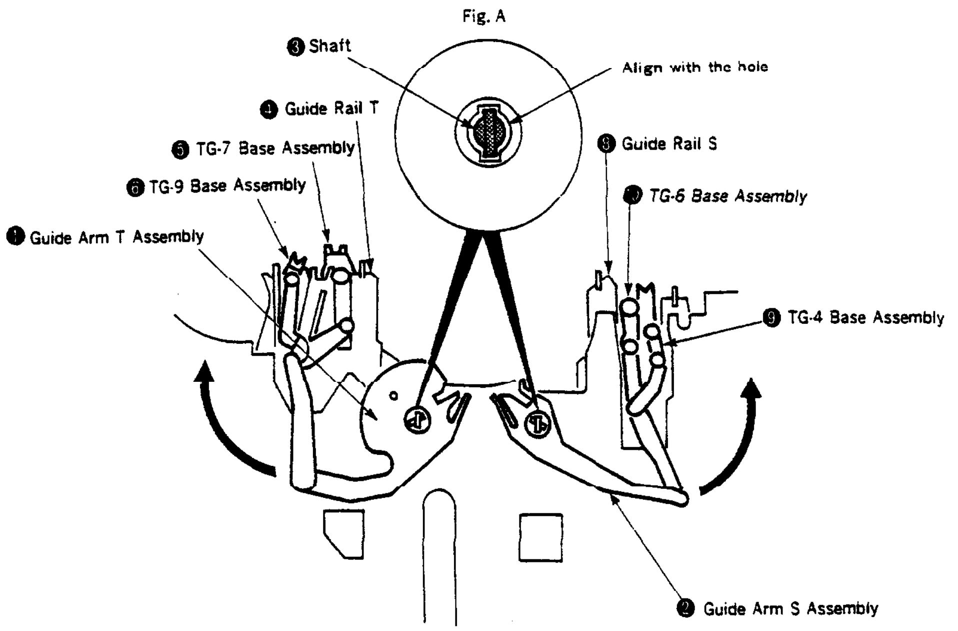


Fig. A
③ Shaft
Align with the hole
④ Guide Rail T
⑤ TG-7 Base Assembly
⑥ TG-9 Base Assembly
① Guide Arm T Assembly
⑧ Guide Rail S
⑩ TG-6 Base Assembly
⑨ TG-4 Base Assembly
② Guide Arm S Assembly

LS Chassis Assembly Viewed from Back

Fig. 24

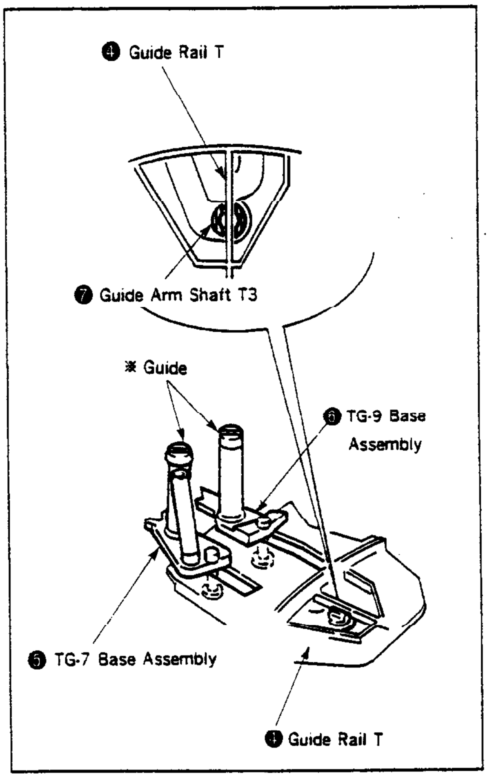
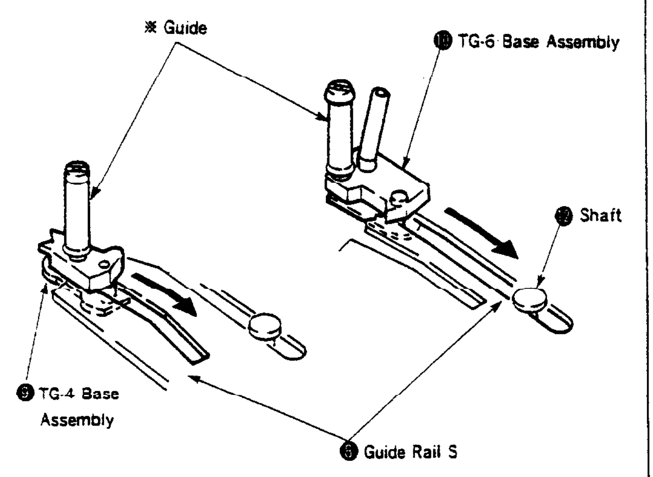

❹ Guide Rail T
❼ Guide Arm Shaft T3
※ Guide
❻ TG-9 Base Assembly
❺ TG-7 Base Assembly
❹ Guide Rail T

Fig. 25


※ Guide
❿ TG-6 Base Assembly
⓬ Shaft
❾ TG-4 Base Assembly
❽ Guide Rail S

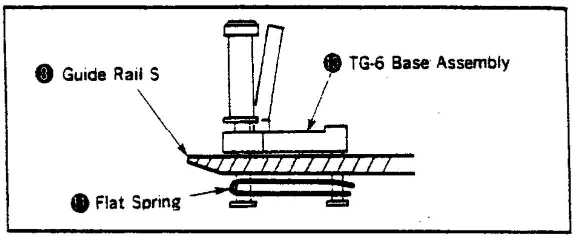

❽ Guide Rail S
❿ TG-6 Base Assembly
⓫ Flat Spring

Fig. B

Fig. 26

13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Remove the screw ❶, and then, pinch press arm assembly ❷.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ❷ at 3 places.
3) Put the pin ❹ of the pinch press arm assembly ❷ in the groove of the cam B ❸.
4) Fix. with the screw ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

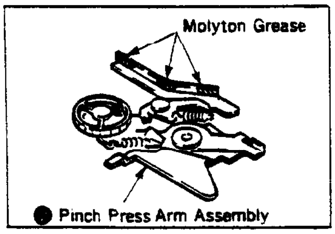

Molyton Grease
❷ Pinch Press Arm Assembly

Fig. B

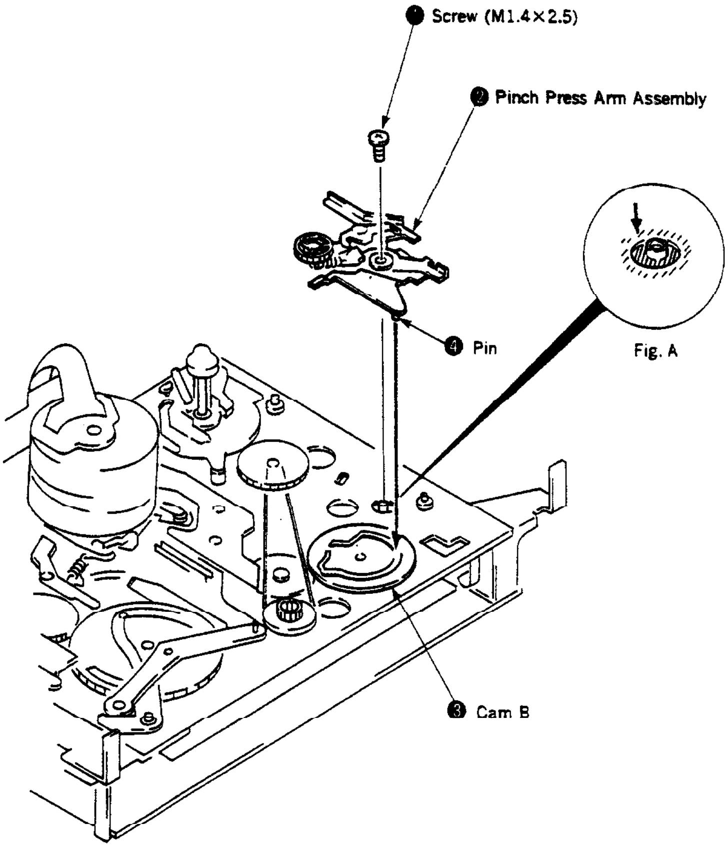

❶ Screw (M1.4×2.5)
❷ Pinch Press Arm Assembly
❹ Pin
Fig. A
❸ Cam B

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrow Ⓐ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the groove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrow Ⓐ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ※ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

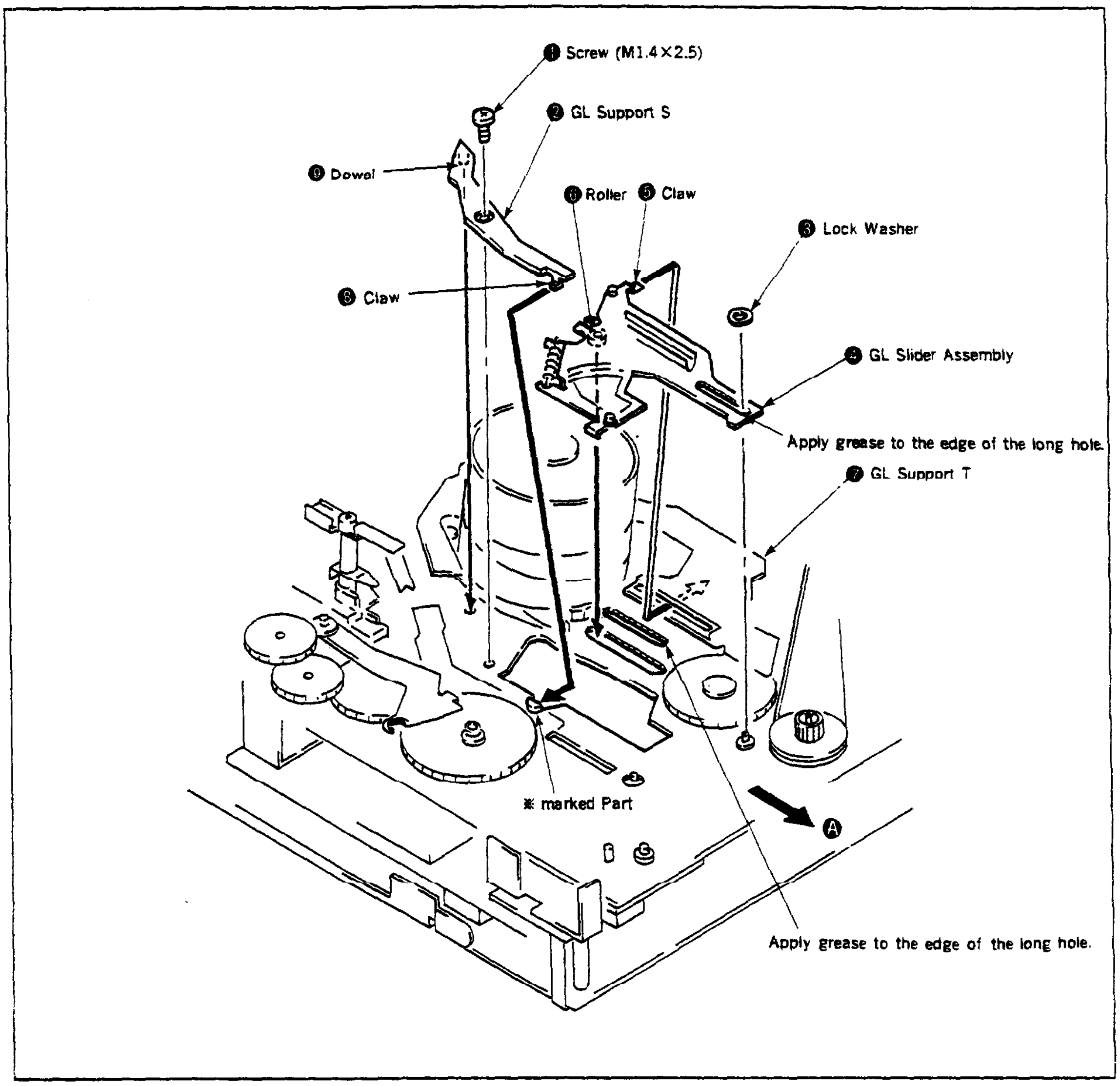

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
※ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ❶, and remove the TG-1 cam base ❷ by moving it in a direction of the arrow Ⓐ. (Remove the notch ● from the groove of the No. 3 gear shaft.)
4) Remove the screw ❸, and remove the gear retainer ❹ by sliding it in a direction of the arrow Ⓑ.
5) Remove the arm assembly ❺, No. 0 gear ❻, No. 1 gear assembly ❼, No. 2 gear assembly ❽, No. 3 gear assembly ❾, lock washer ❿, and then, mode gear assembly ●, respectively.
6) Being careful not to lose the LS roller ● of the LS arm, remove the LS arm assembly ● and EJ arm ●, respectively.
7) Remove the screw ●, and then, cam A ●.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw ●, and then, cam B ●.

2. Adjustment and Mounting

1) Face the hole ⓐ of the mode gear assembly ● to a direction of the arrow Ⓐ, move the GL slider assembly ● in a direction of the arrow Ⓑ, apply molyton grease to the pin of the GL slider assembly ●, and mount the LS roller ●. (Fig. 30)
2) Set a direction of the cam A ● so that the hole ⓒ of the cam A ● will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider ● so that the LS roller ● will be placed into the groove ⓓ of the cam A ●. At the same time, engage the mode gear assembly ● with the gear of the relay gear A ●, and mount the cam A ●. Insert a stick of about ϕ1.5mm in the hole ⓒ of the cam A ●. (Fig. 31)
4) Align the hole ⓔ of the cam B ● with the hoie of the mechanical chassis. At the same time, engage the relay gear B ● with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the hole ⓕ of the No. 3 gear assembly ❾ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly ● with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ❽, No. 1 gear assembly ❼ and No. 0 gear ❻ in that order. Mount the arm assembly ❺ to the shaft and put the pin ● in the groove of the No. 3 gear assembly ❾, (Fig. 34)
8) Put the TG-1 cam base ❷ in place, fit the notch ● to the shaft and shift it in an arrow direction, and mount the screws ❶ and ❶ in that order. (Fig. 35)
9) Put the gear retainer ❹ in place, slide it in an arrow direction and fix it with the screw ❸. (Fig. 36)
10) Seeing to it that the EJ arm ● and the LS roller ● of the LS arm assembly ● are put in the groove ⓖ of the cam A ●, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.

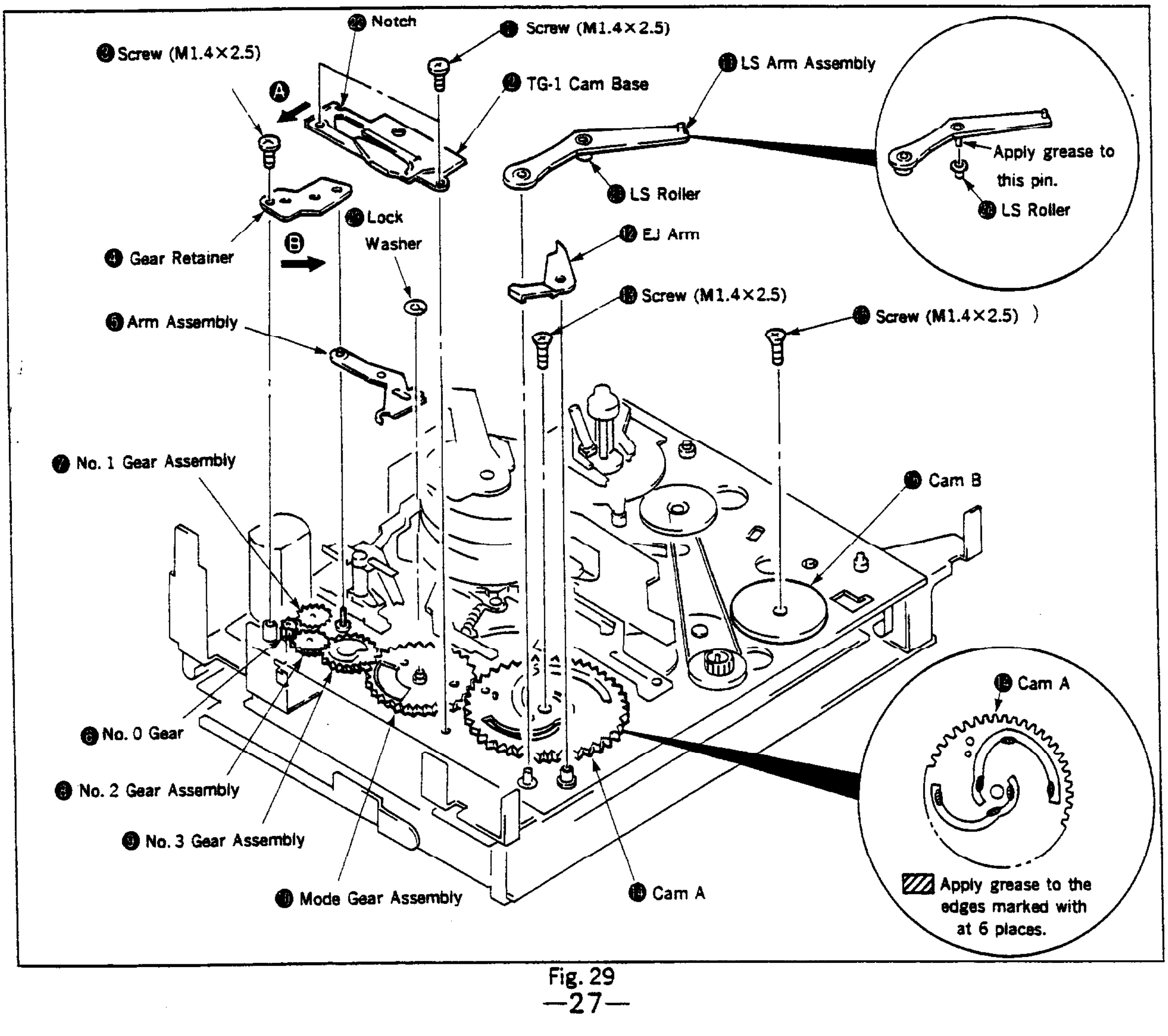

Notch
Screw (M1.4×2.5)
Screw (M1.4×2.5)
TG-1 Cam Base
LS Arm Assembly
A
Apply grease to this pin.
LS Roller
LS Roller
Lock Washer
Gear Retainer
B
EJ Arm
Screw (M1.4×2.5)
Screw (M1.4×2.5)
Arm Assembly
No. 1 Gear Assembly
Cam B
Cam A
No. 0 Gear
No. 2 Gear Assembly
No. 3 Gear Assembly
Mode Gear Assembly
Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

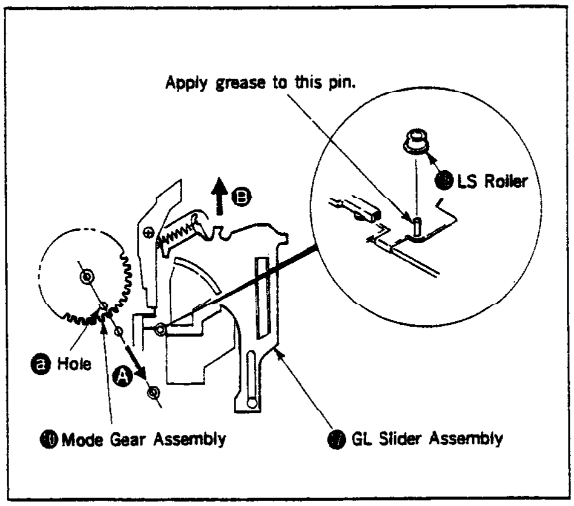

Apply grease to this pin.
⑲ LS Roller
Ⓑ
ⓐ Hole
Ⓐ
⑩ Mode Gear Assembly
⑰ GL Slider Assembly

Fig. 30

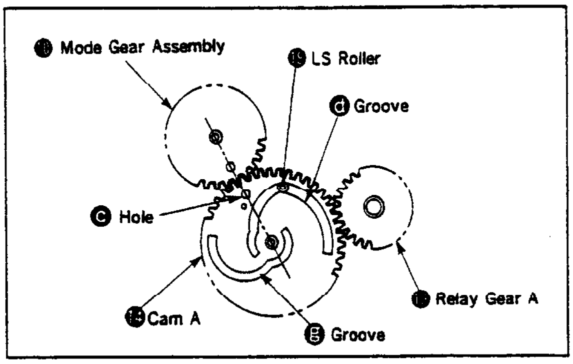

⑩ Mode Gear Assembly
⑲ LS Roller
ⓓ Groove
ⓒ Hole
⑭ Cam A
ⓑ Groove
⑮ Relay Gear A

Fig. 31

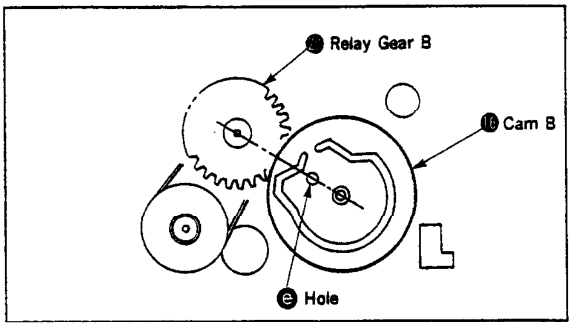

⑫ Relay Gear B
⑯ Cam B
ⓔ Hole

Fig. 32

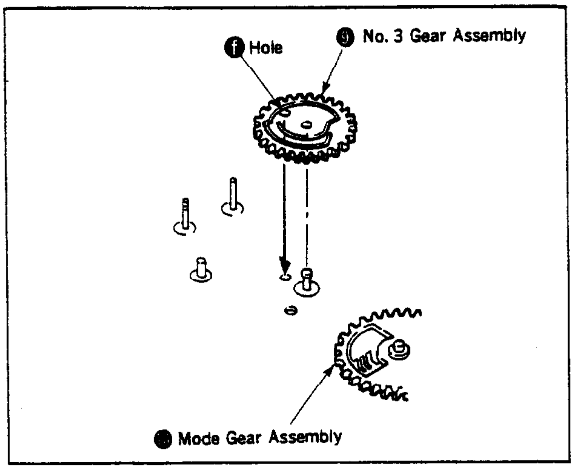

ⓕ Hole
⑨ No. 3 Gear Assembly
⑩ Mode Gear Assembly

Fig. 33

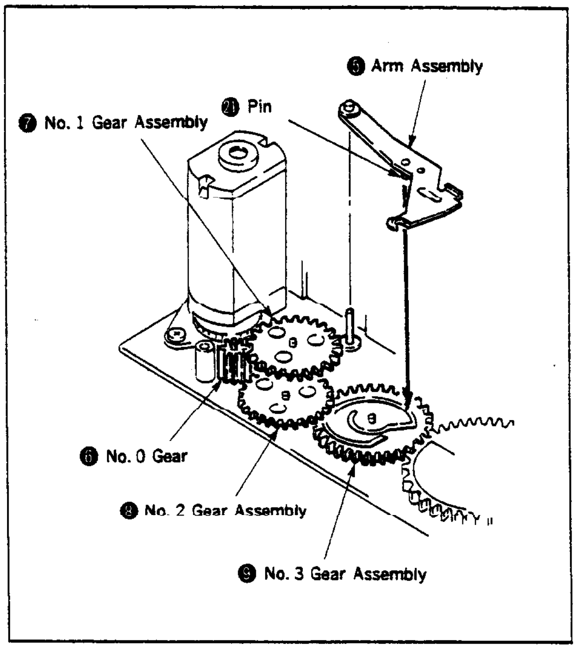

⑤ Arm Assembly
㉑ Pin
⑦ No. 1 Gear Assembly
⑥ No. 0 Gear
⑧ No. 2 Gear Assembly
⑨ No. 3 Gear Assembly

Fig. 34

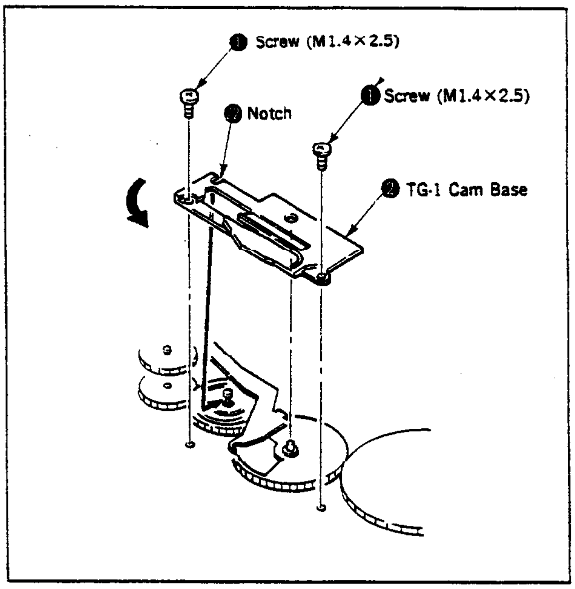

① Screw (M1.4×2.5)
① Screw (M1.4×2.5)
㉒ Notch
② TG-1 Cam Base

Fig. 35

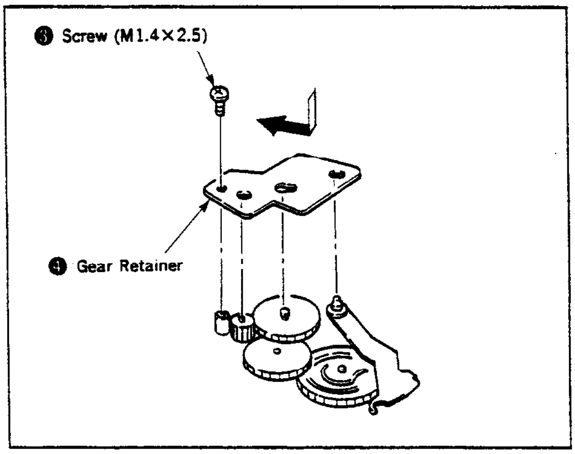

③ Screw (M1.4×2.5)
④ Gear Retainer

Fig. 36

.6 GEAR TRAIN OPERATION CHECK (Fig. 37)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Referring to 3-17, remove the loading motor.

Check

Insert the tip of tweezers into the hole a of the cam A ❶.

Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.

When this is done, check that each, gear, the CL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.

4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

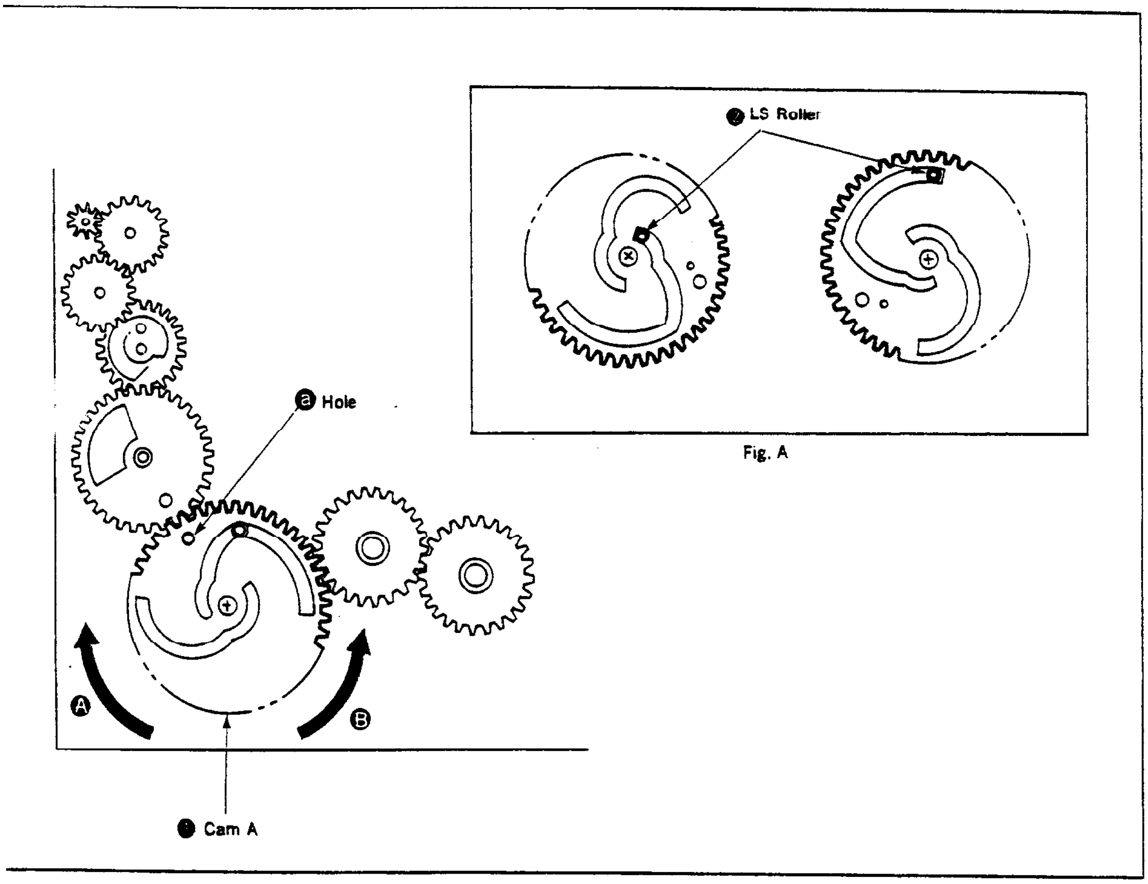


Fig. A

Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

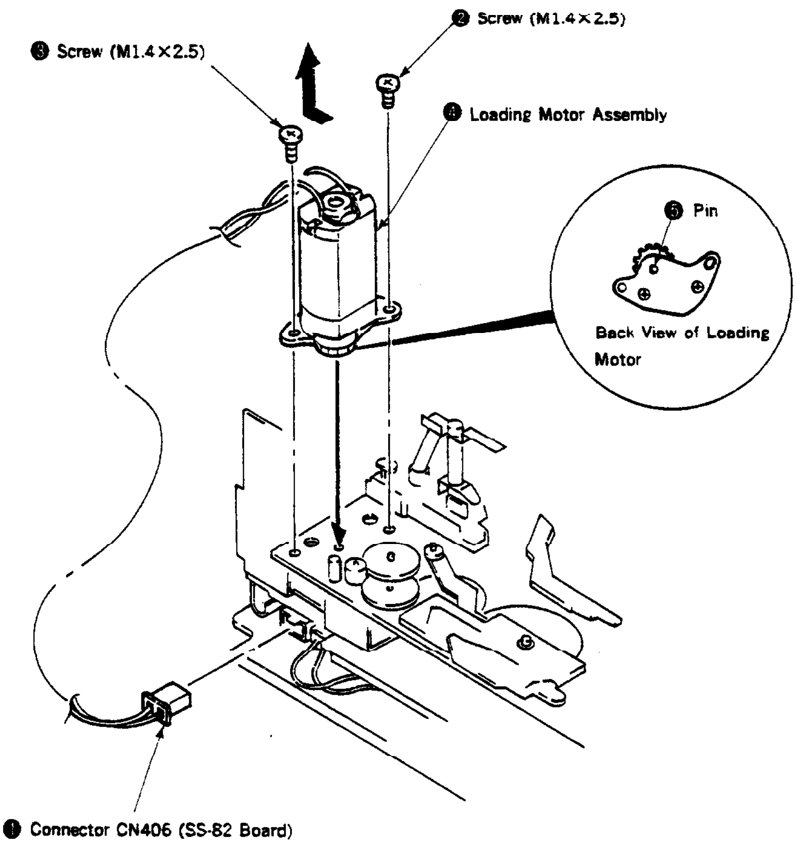

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ●, and then, guide rail base 1 assembly ●.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ●. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ● of the guide rail base 1 assembly ● in the notch of the chassis, and tighten the two screws ● with a torgue of 0.6kg•cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ● with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

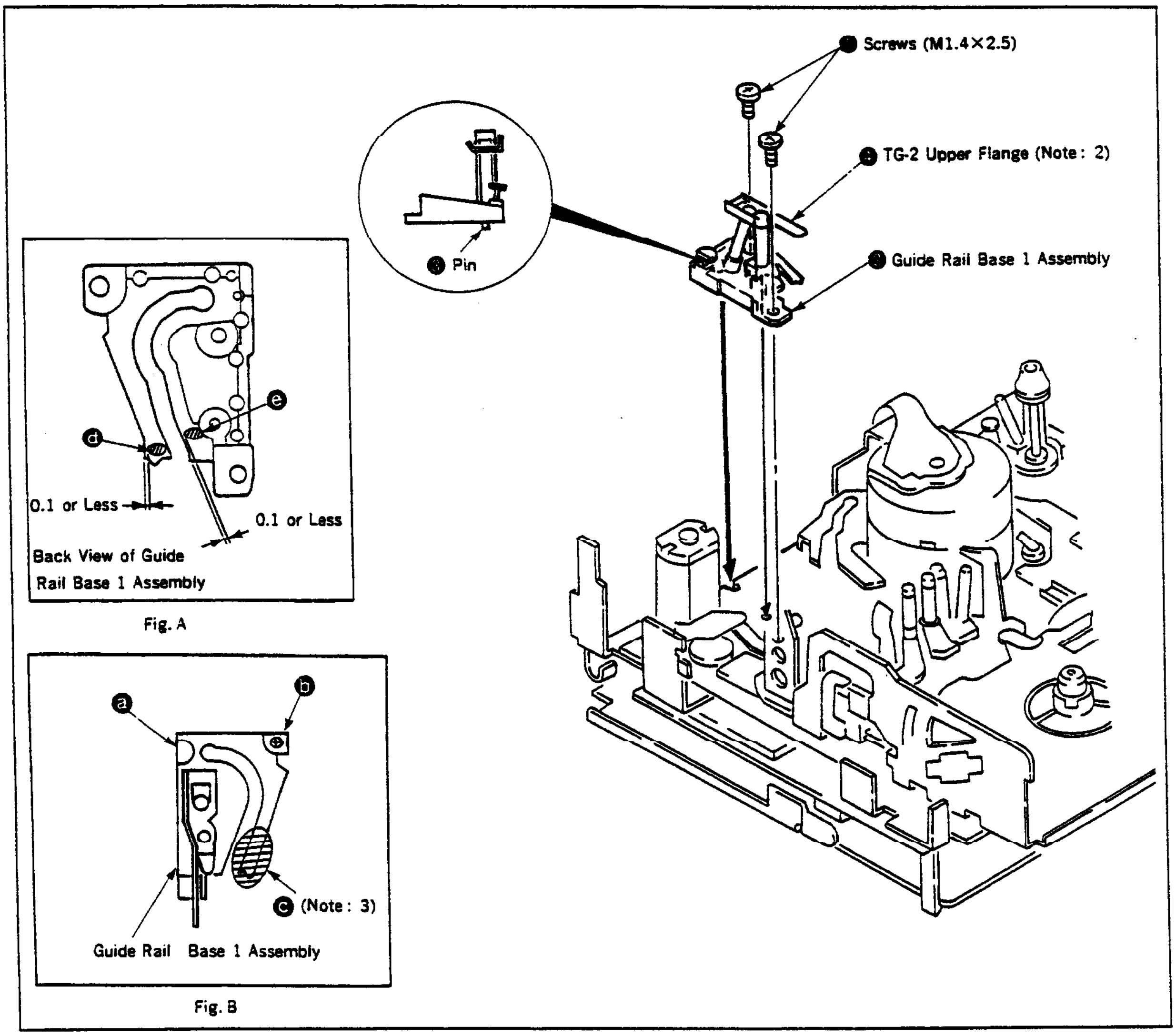

● Screws (M1.4×2.5)
● TG-2 Upper Flange (Note: 2)
● Guide Rail Base 1 Assembly
● Pin
ⓔ
ⓓ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
ⓐ
ⓑ
ⓒ (Note: 3)
Guide Rail Base 1 Assembly

Fig. A

Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ●, and then, frame B assembly ● in a direction of the arrowⒶ.
4) Unskate the LS chassis a little.
5) Remove the two screws ●, and then, guide rail base 2 assembly ● in a direction of the arrowⒷ.

Note : Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ● to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ✱ of the guide rail base 2 assembly ● lightly in a direction of ⓔ (Fig. B), tighten the two screws ● with a torque of 0.8kg•cm.

Note : Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ●.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

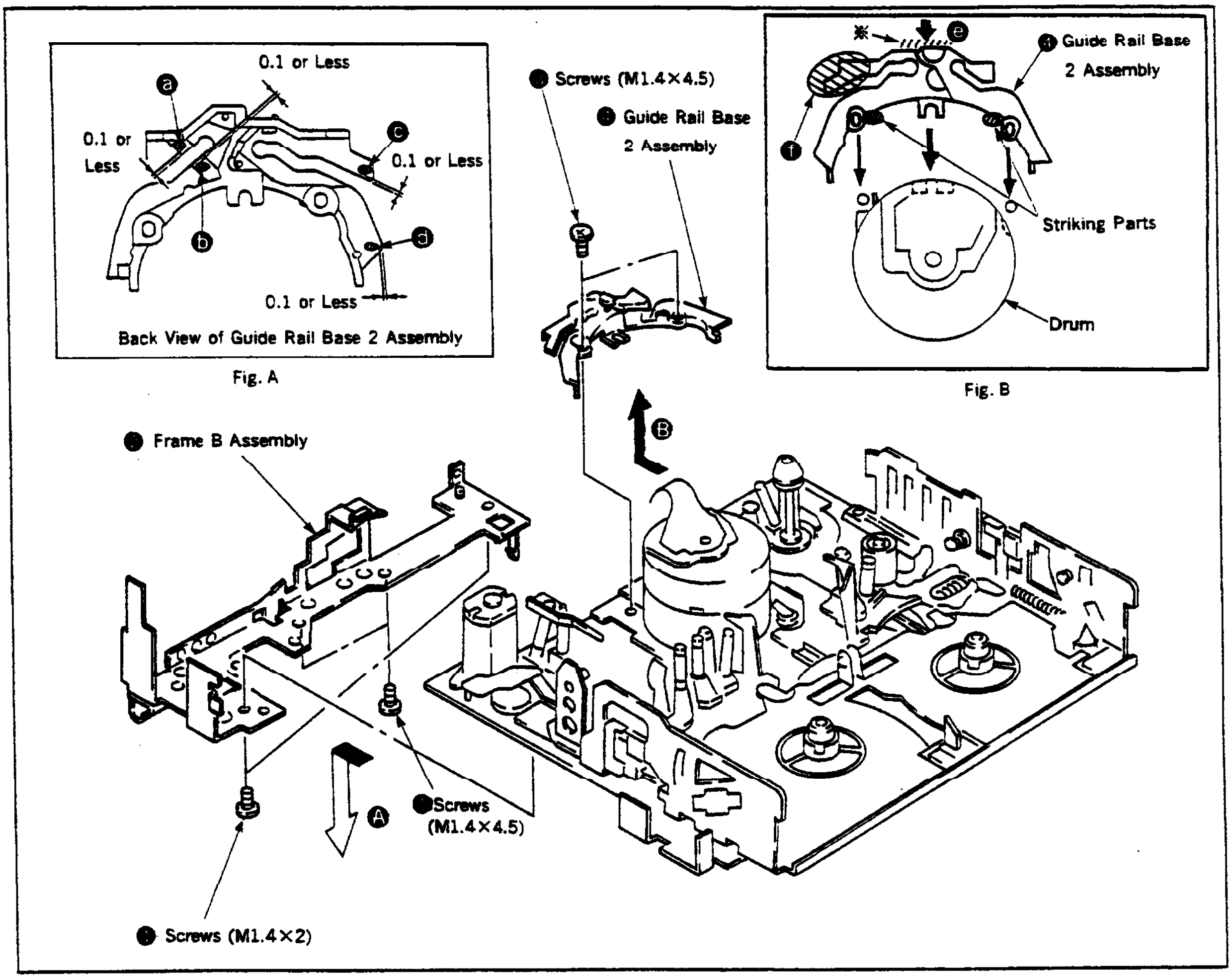

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
● Screws (M1.4×4.5)
● Guide Rail Base 2 Assembly
✱
ⓔ
● Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Ⓑ
● Frame B Assembly
Ⓐ
●Screws (M1.4×4.5)
● Screws (M1.4×2)

Fig. A

Fig. B

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ❸.
3) Remove the two screws ❶. Remove the guide rail base 3 assembly ❷ in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ⁎ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ❷. (Fig. A)
2) Mount the guide rail base 3 assembly ❷, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ❶ with a torque of 0.6kg•cm.
4) Mount the flexible rotary shaft ❸.
5) Referring to 1-1, mount the cassette compartment holder assembly.

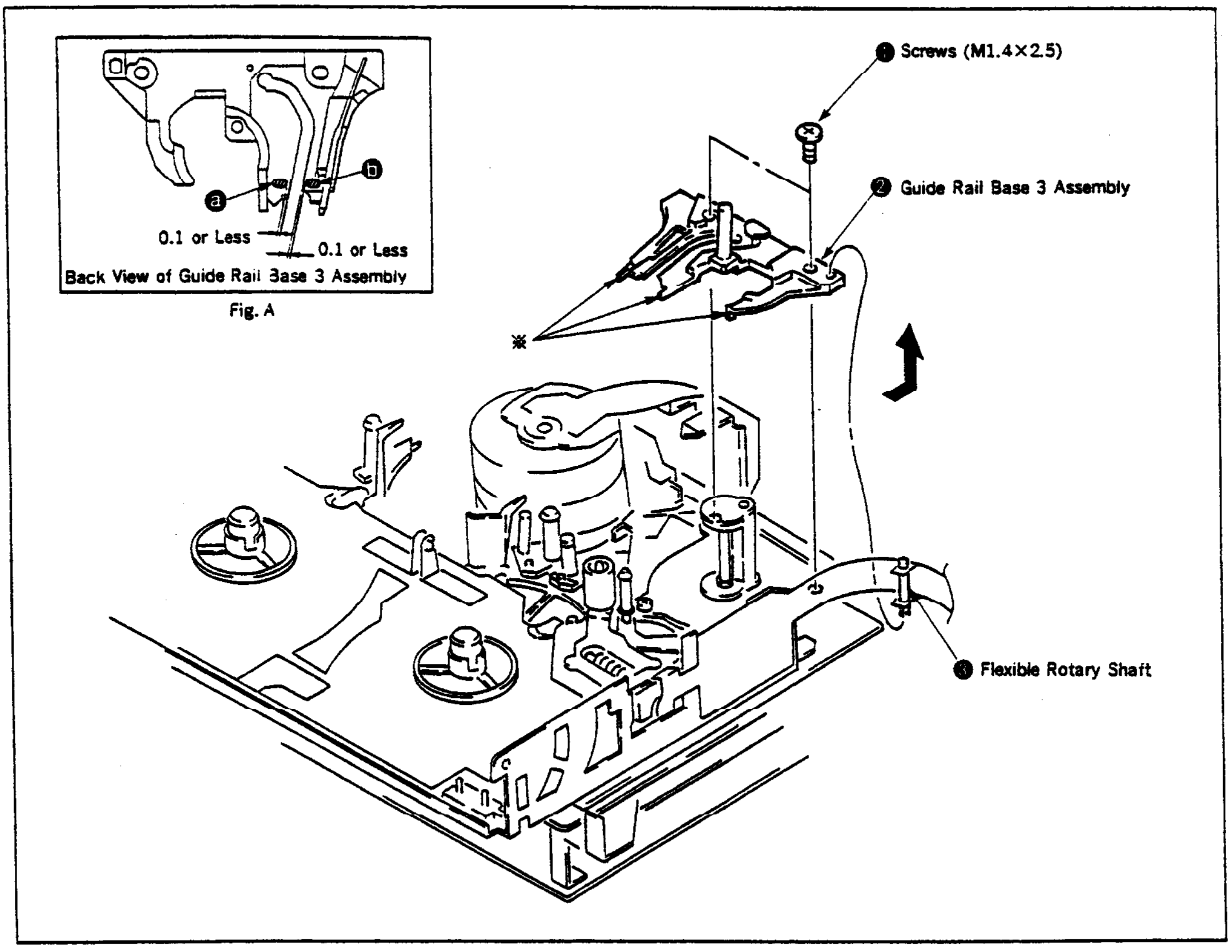

ⓐ
ⓑ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
❶ Screws (M1.4×2.5)
❷ Guide Rail Base 3 Assembly
⁎
❸ Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ● of the capstan motor assembly ●.
4) Remove the screw ●. Disengaging the gear of the conversion gear assembly ●, remove the capstan motor assembly ● in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ● to engage the gear of the capstan motor assembly ● with that of the conversion gear assembly ●, and tighten the screw 3 with a torque of 1kg•cm.
   When this is done, be careful not to damage the gear of the conversion gear assembly ●.
2) Mount the connector 2 to the capstan motor assembly ●.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

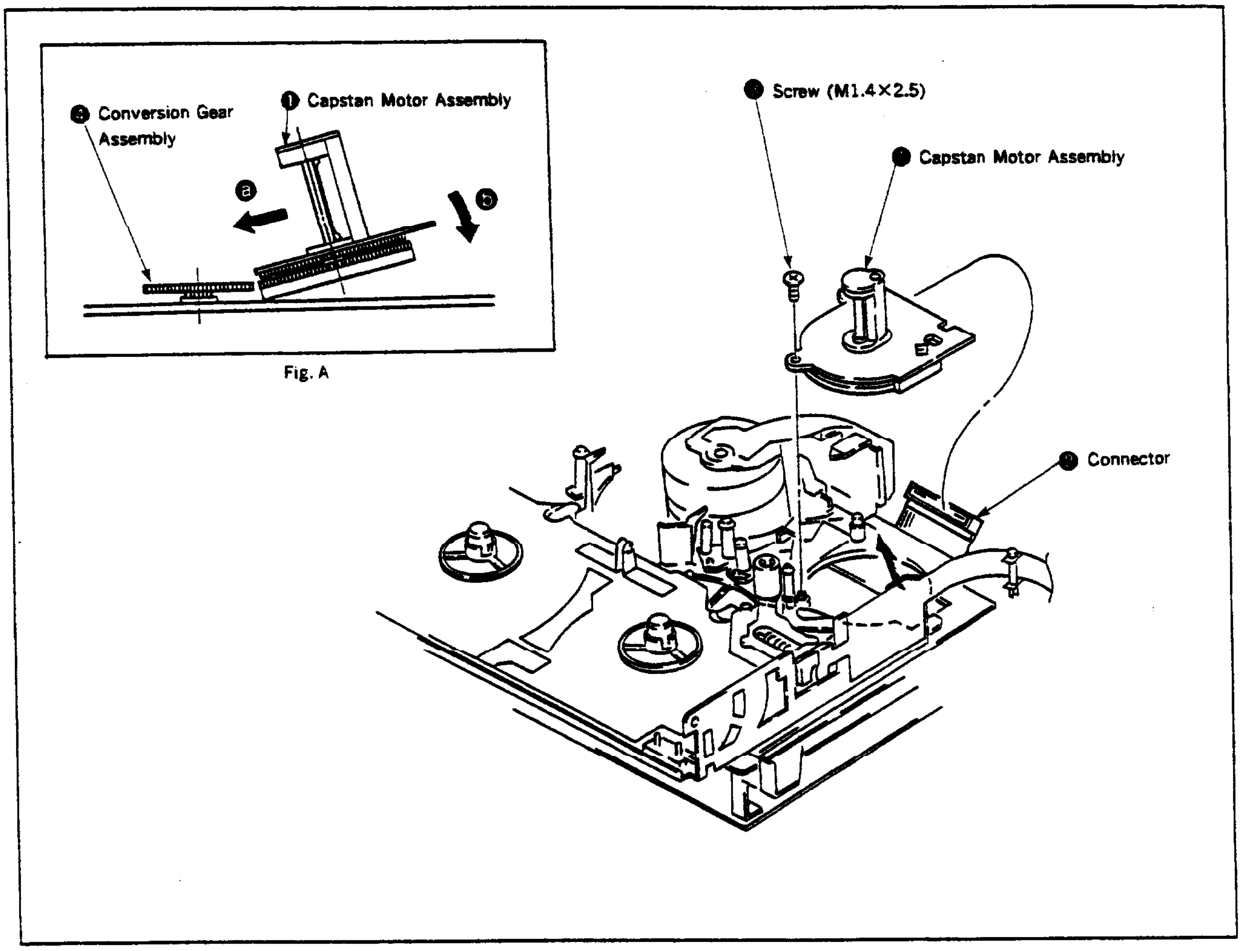

● Conversion Gear Assembly
● Capstan Motor Assembly
a
b
Fig. A
● Screw (M1.4×2.5)
● Capstan Motor Assembly
● Connector

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ❷.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis and put the positioning pins ❹ of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ❷ with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

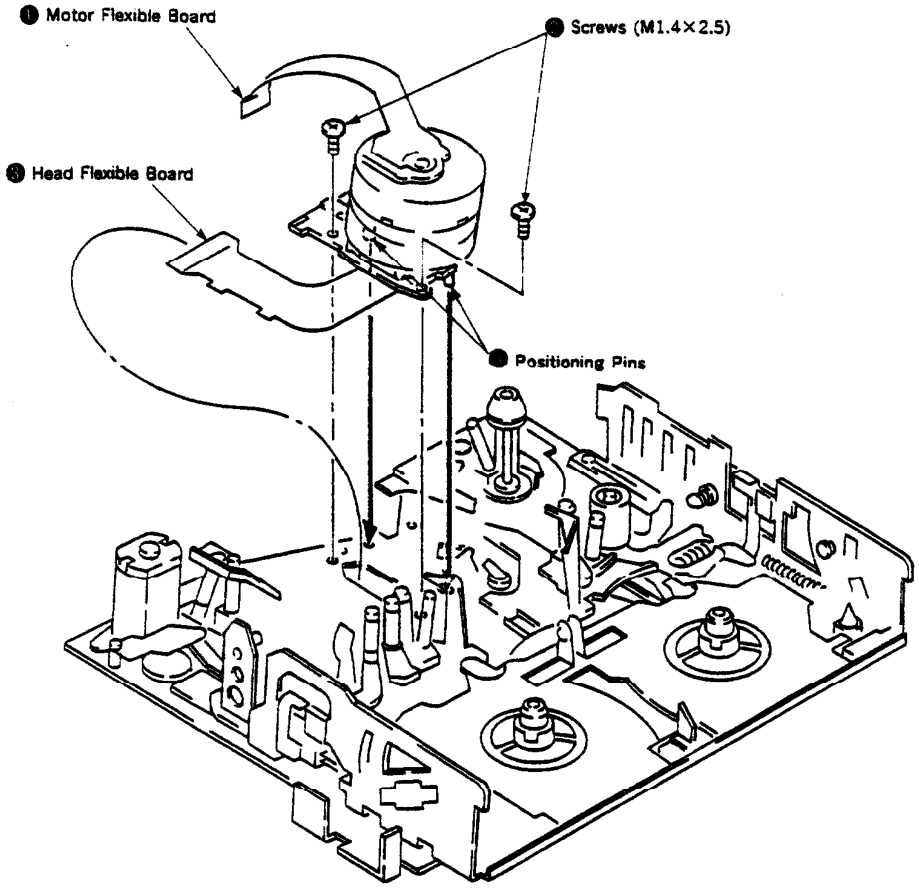


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ❷ from the back of the mechanical chassis.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ❹.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ❷ with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

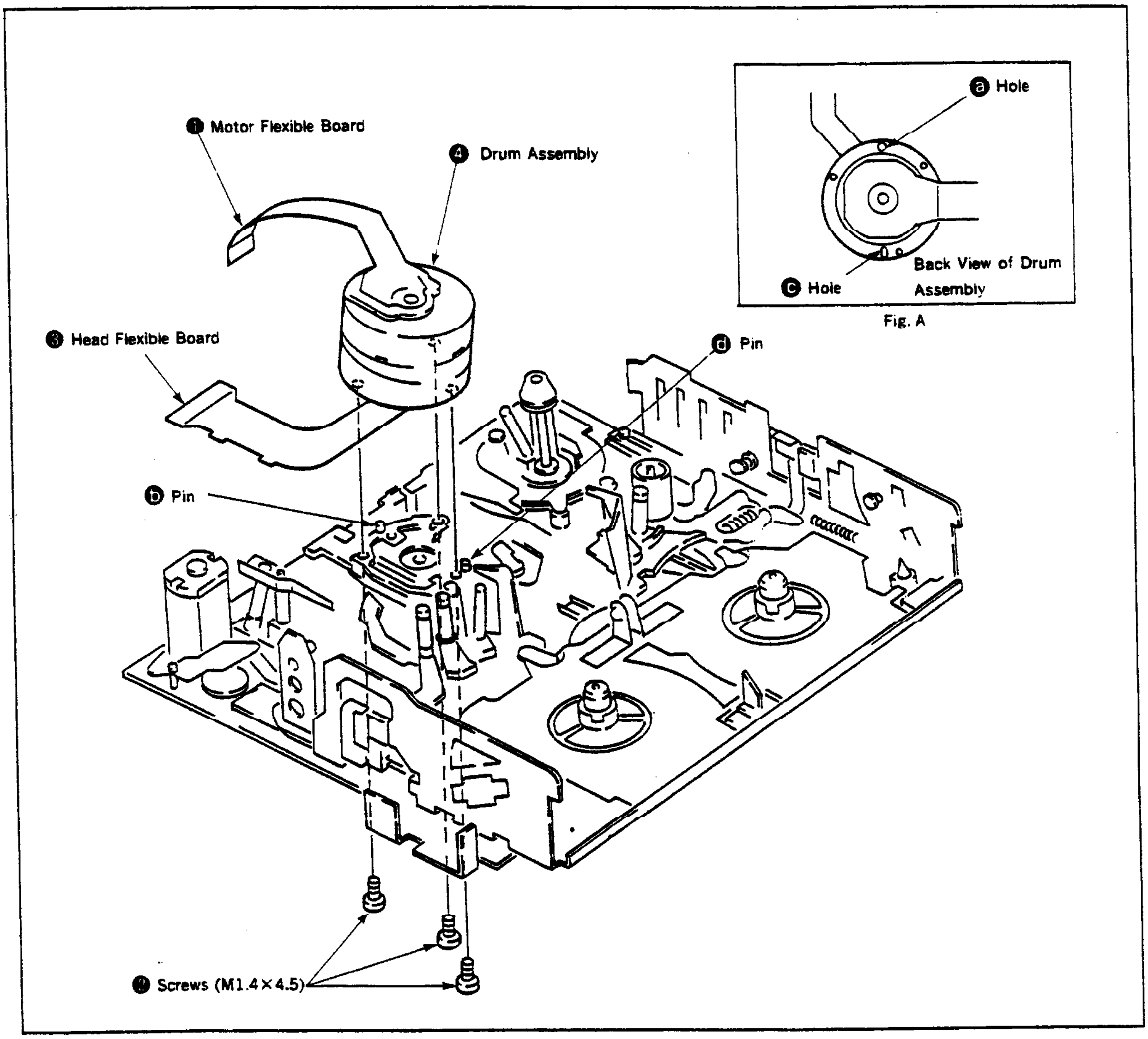
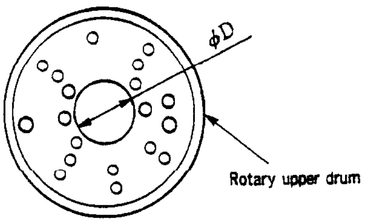

ⓐ Hole
❶ Motor Flexible Board
❹ Drum Assembly
Back View of Drum Assembly
ⓒ Hole
Fig. A
❸ Head Flexible Board
ⓓ Pin
ⓑ Pin
❷ Screws (M1.4×4.5)

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC:

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL:

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

➡

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ●. (Fig. 44)
3) Hold the outlet (base) of the guide protector ●, lift it up obliquely. In that state, hold the outer figure of the back yoke ● and remove it. (Fig. 44)

Note : Note that the flexible board and guide protector ● easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ● around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotary upper drum assembly ●. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotor ●. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface● and the surface of the rotary upper drum assembly ● which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin● will be put in the reference hole of the rotary upper drum assembly ●, and push it in lightly. (Fig. 45)

Note : Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ● (800g•cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ● of the rotor ● in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ●. (800g•cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ● from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss●. (Fig. B in Fig. 45)

Note : See to it that the rotor earth spring ● is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ●, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ●. (500g•cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note : After mounting, be sure to make tape path adjustment in Section 4.

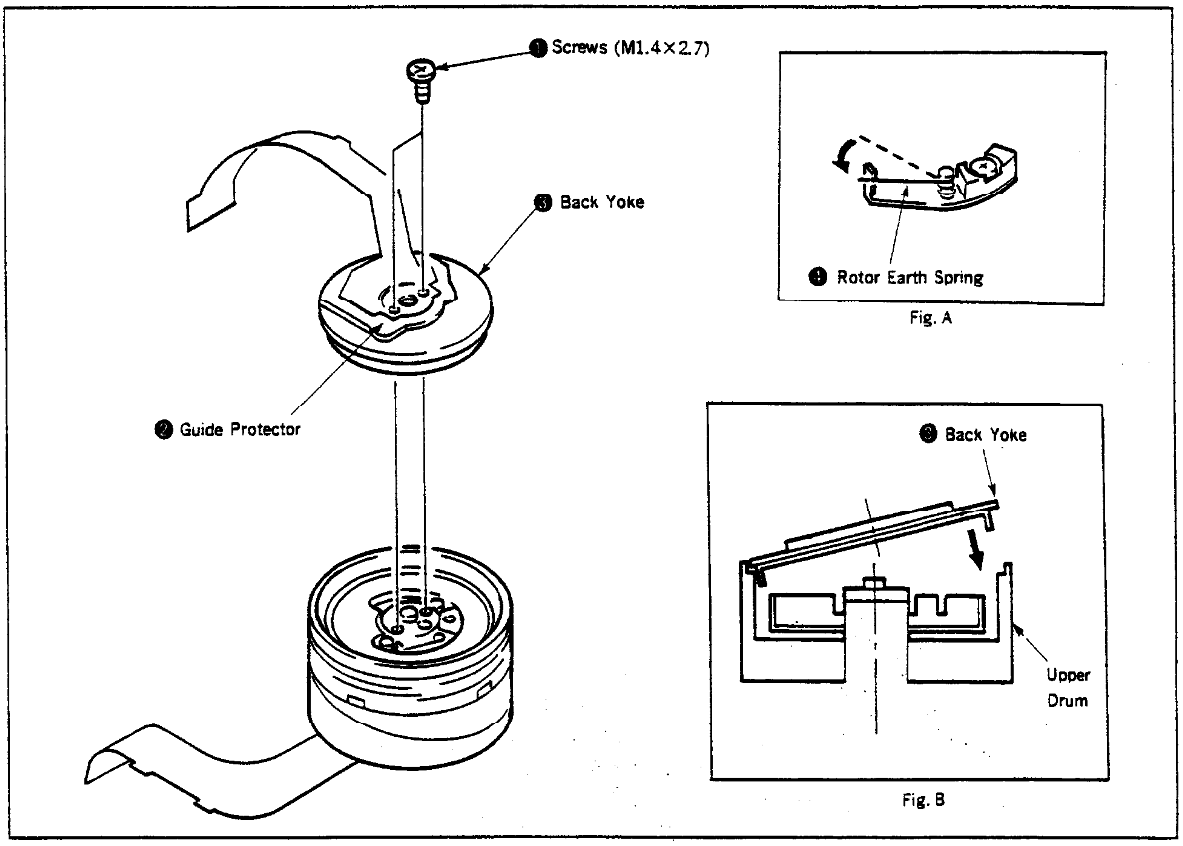

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
❸ Back Yoke
Upper Drum

Fig. A

Fig. B

Fig. 44

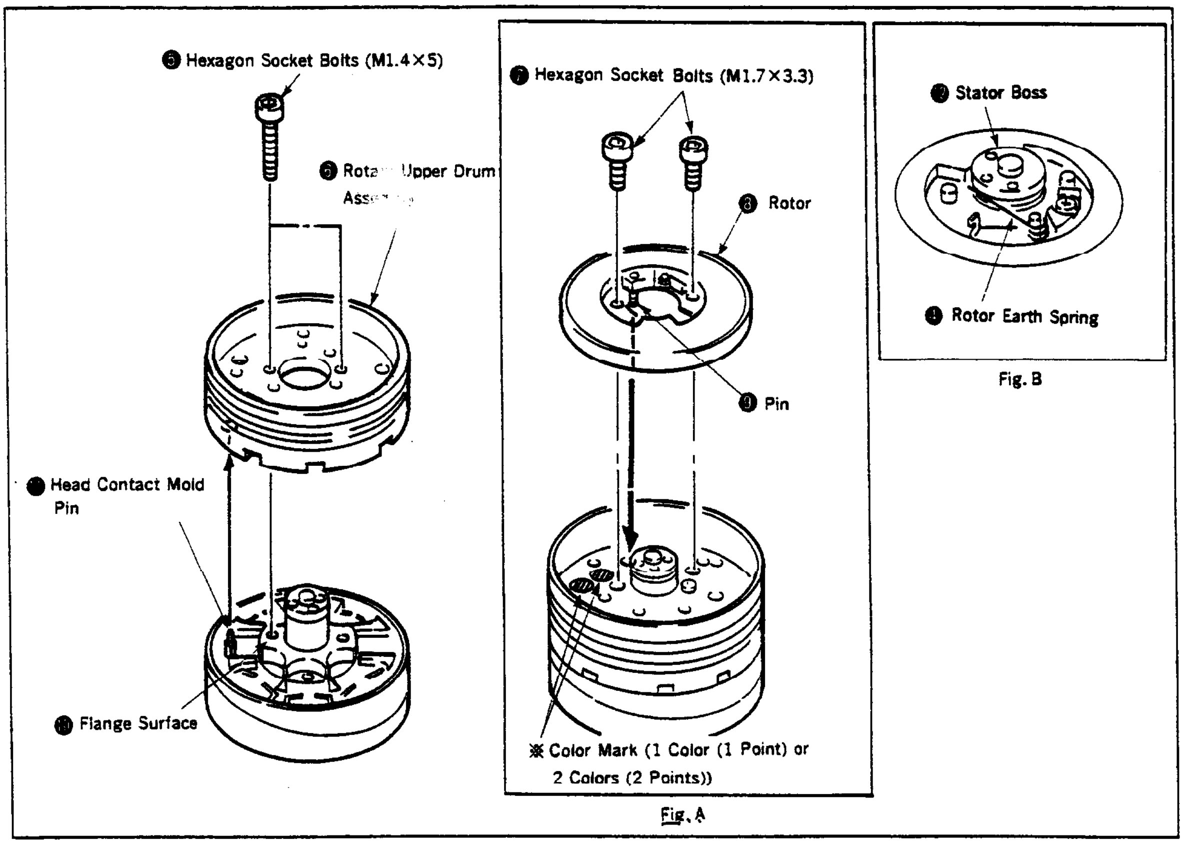

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rotary Upper Drum Assembly
● Head Contact Mold Pin
⓭ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
⓬ Stator Boss
❹ Rotor Earth Spring

Fig. A

Fig. B

Fig. 45

5 REEL TABLE HEIGHT CHECK (Fig. 46)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-1, remove the LED base.

Check

Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are ~~3.2 ± 0.5mm~~ respectively.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

changed values

A: $3.2^{+0.2}_{-0.15}$mm

B: 3.2 ± 0.15mm

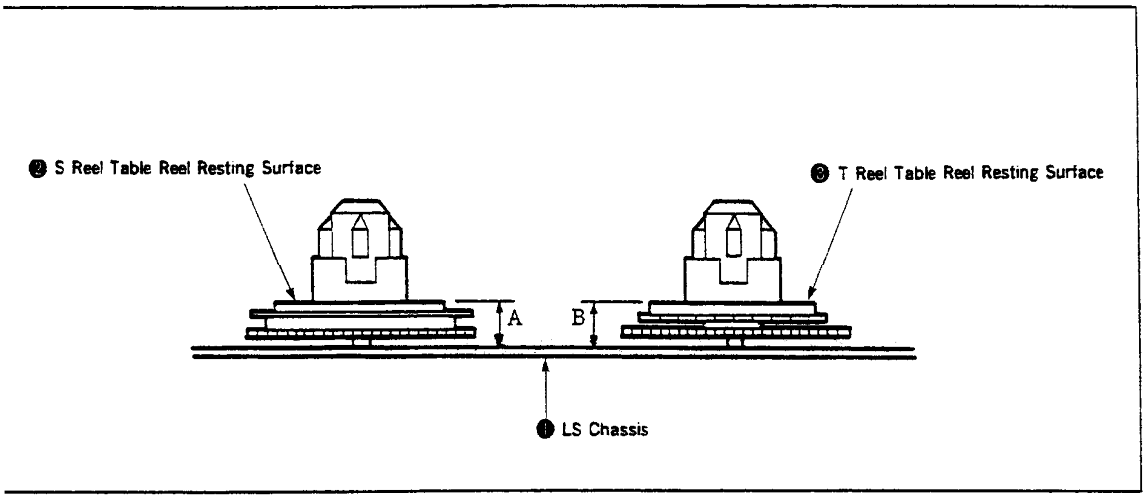

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

6 FWD/RVS TORQUE CHECK

Set the FWD/RVS take-up torque cassette (Ref. No. J-10).

In the FWD mode, check that a T reel torque value is ~~6g•cm — 16g•cm~~ ☚ **changed value** 5 – 15g•cm.

Turn on the REC/REVIEW button and check that an S reel torque value is 25g•cm – 45g•cm.

When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is ~~0.58±0.2mm.~~ (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.

changed value

9.35 – 10.7mm.

6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

Note : When taking the steps 4) and 5), remove the cassette tape first.

Note : Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

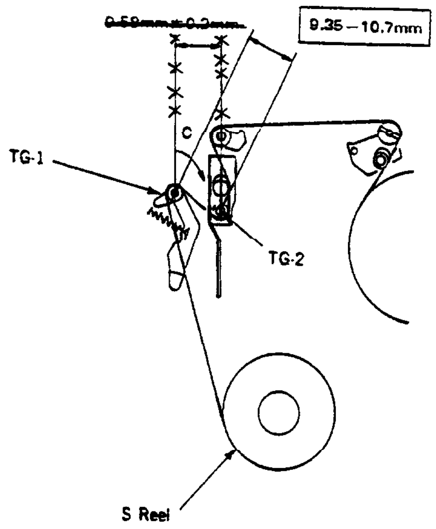


Fig. 47

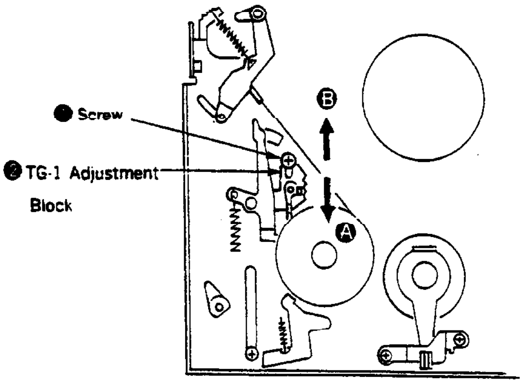


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)❶.
3) Using the dial tension gauge (Ref. No. J-7)❷, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ❸ position as shown in Fig. A so that measure center value of the tention is 4 g-6.5g.

Note : When this is done, see to it that the gear ❹ is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

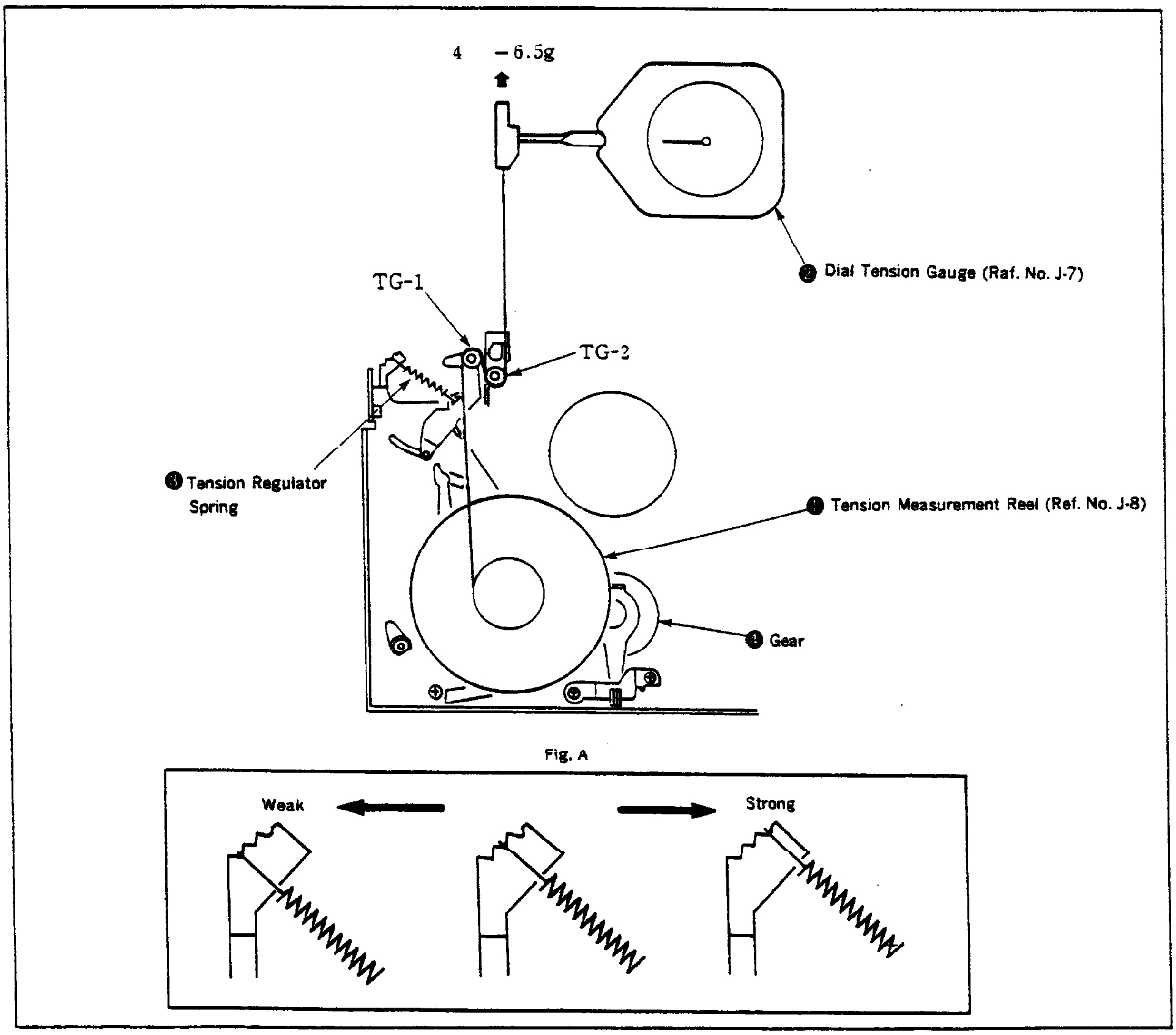

4 −6.5g
❷ Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
❸ Tension Regulator Spring
❶ Tension Measurement Reel (Ref. No. J-8)
❹ Gear
Weak
Strong

Fig. A

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N), (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)
   When it is not flat, make adjustment in accordance with the procedures below.
   When the RF waveform is not flat at the inlet/outlet; (Fig.50 ⓑ and ⓒ)

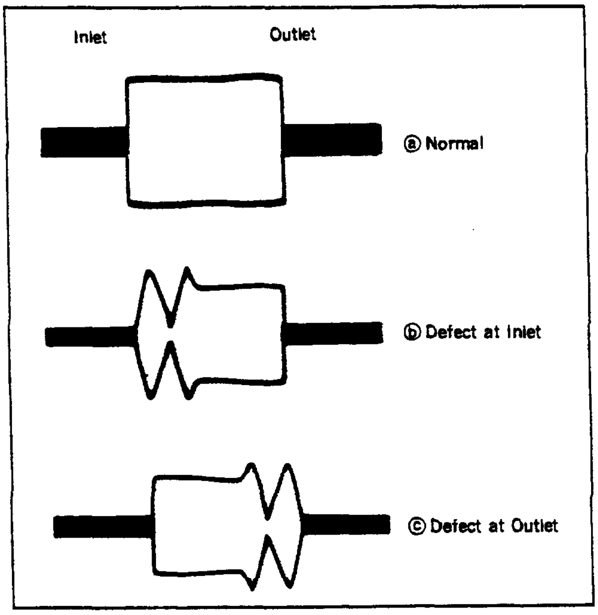

Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50

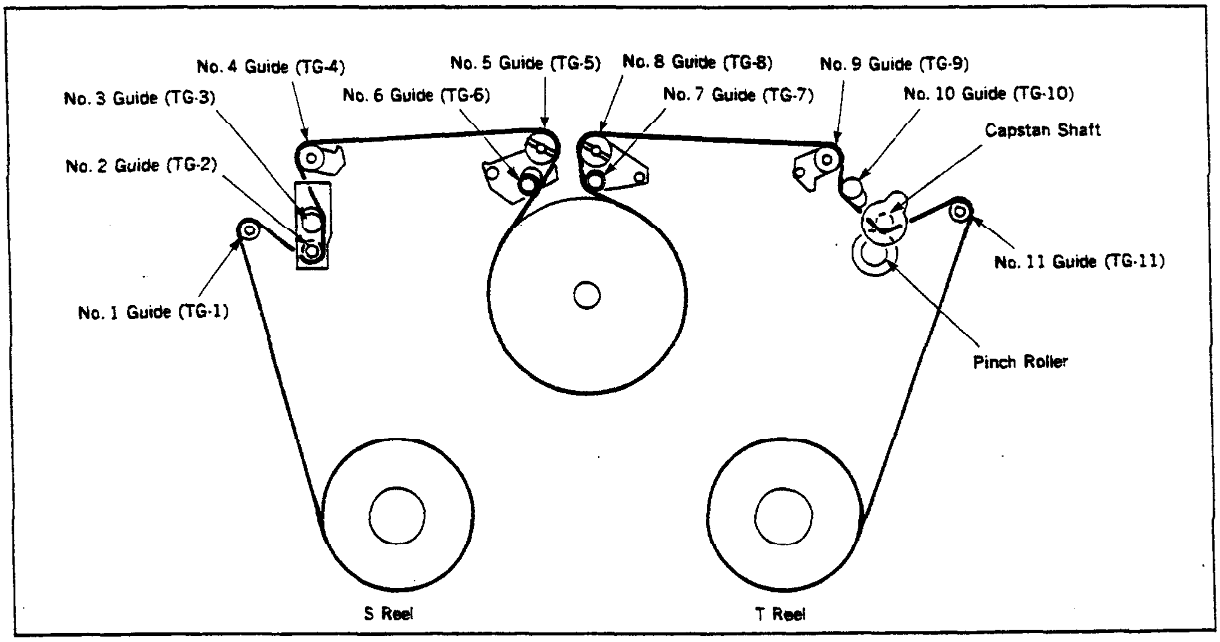

No. 4 Guide (TG-4)
No. 5 Guide (TG-5)
No. 8 Guide (TG-8)
No. 9 Guide (TG-9)
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
No. 7 Guide (TG-7)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ● and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ● to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ● and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ● to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

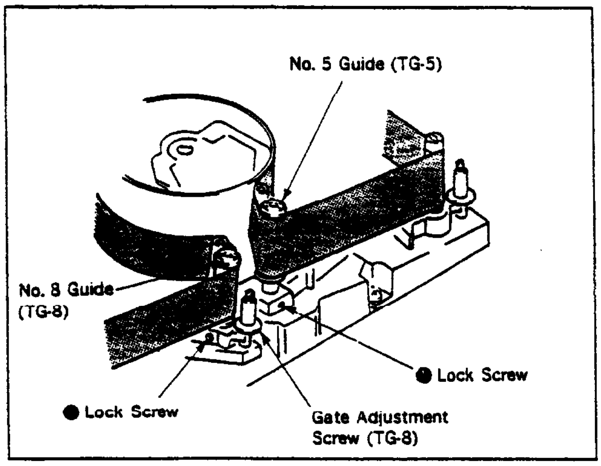


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

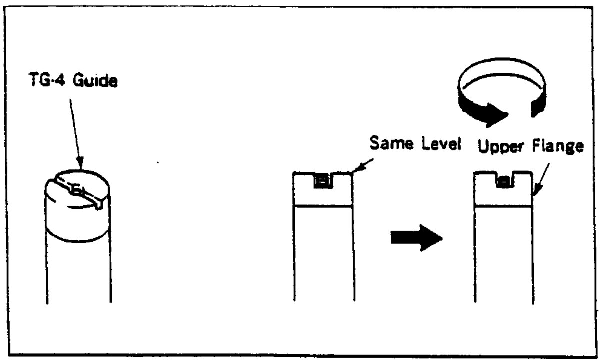


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counterclockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.
When this is done, check that a tracking waveform (Fig. 54) is not changed.
When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

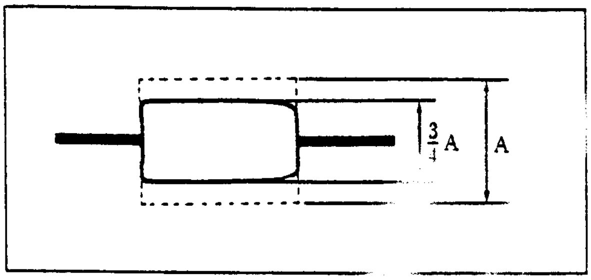


Fig. 54

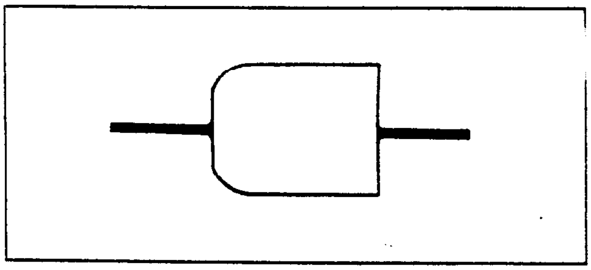


Fig. 55

Tape Path Adjustment for "Guide Rail Base 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lower flange is curled in the REV mode, turn the TG-4 gate adjusting screw at pitches of 45° to the left to remove a curl. (A lock screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw. After adjustment, tighten the lock screw.)

If the TG-4 gate adjusting screw is turned to the left too much, the TG-2 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

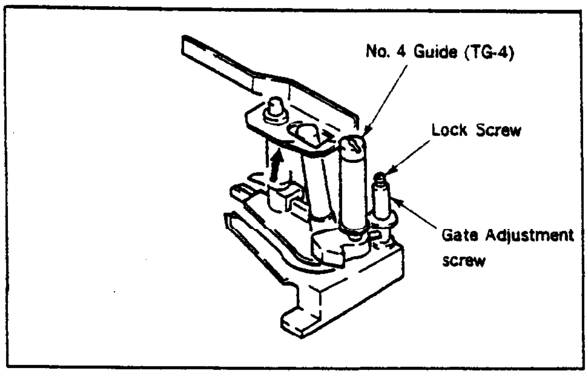


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
   (Criterion: 0.5mm or less)
   when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

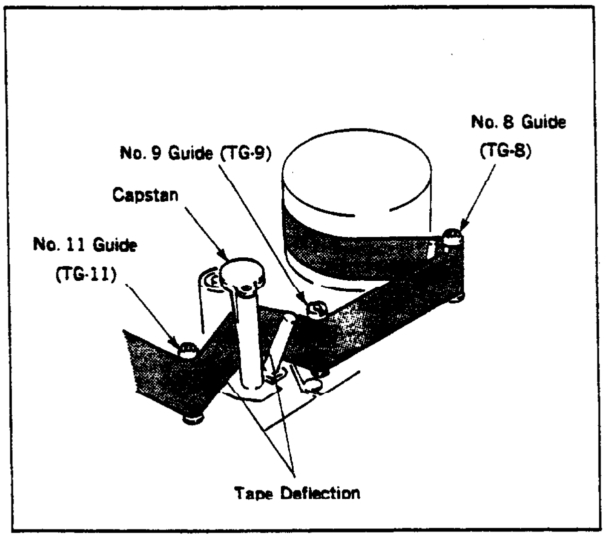

No. 8 Guide
(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

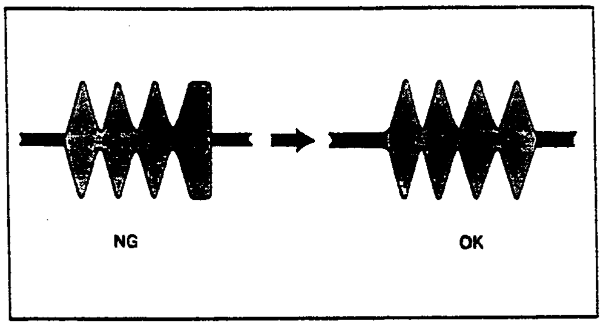


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

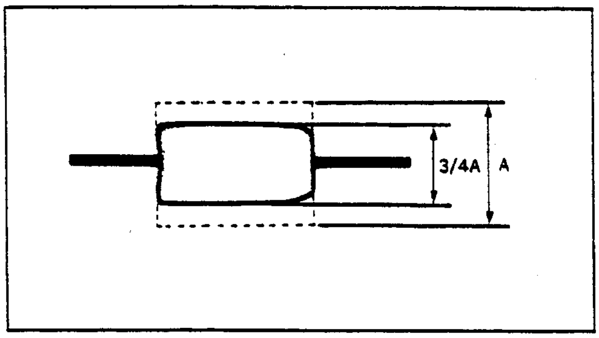


Fig. 59

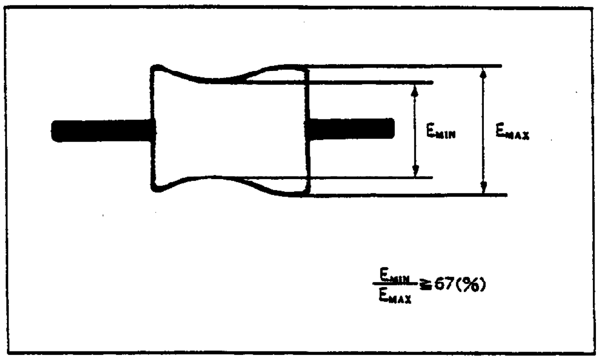


Fig. 60

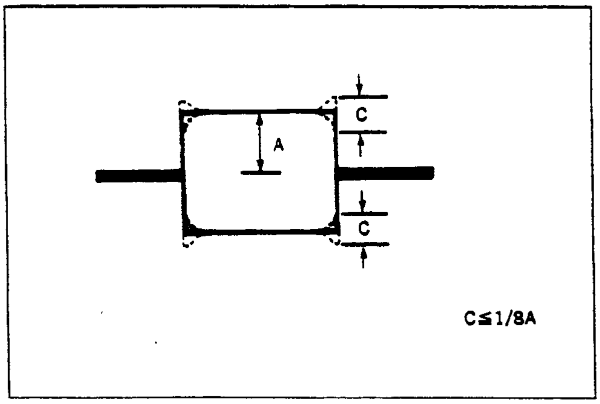


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the REV mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the CUE mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

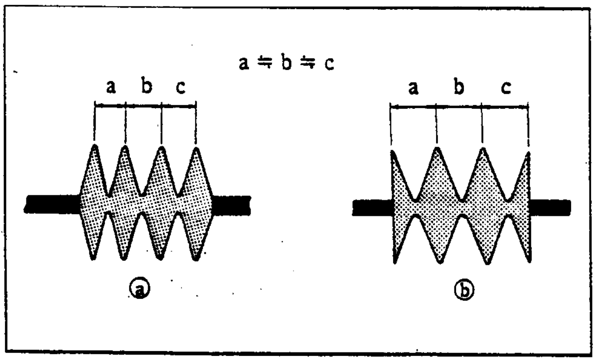


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

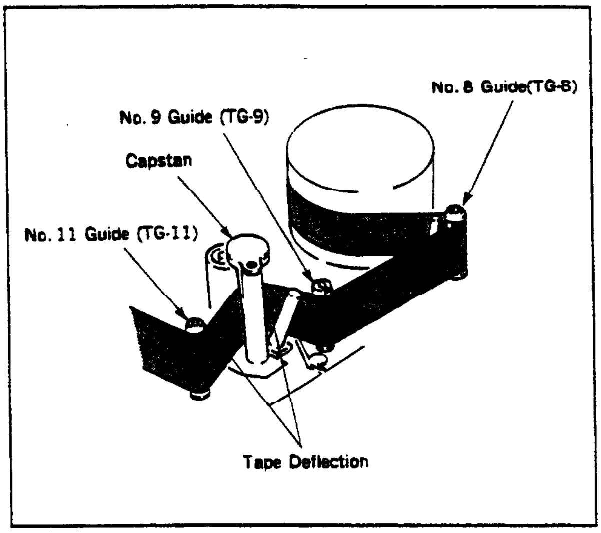

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

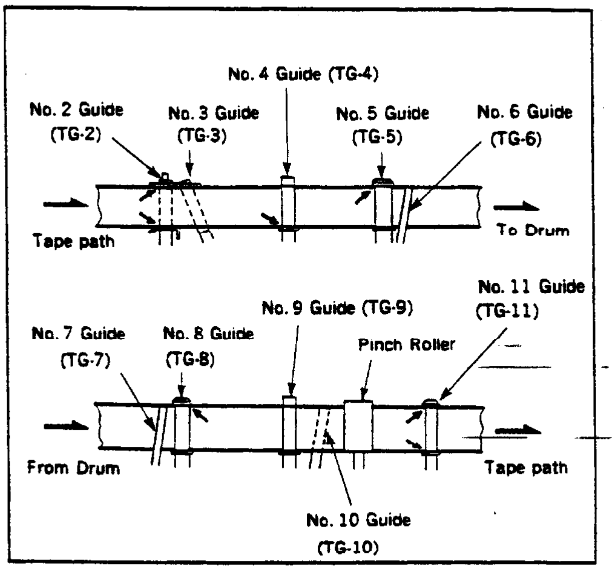

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64